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ABSTRACT

This report on an expert meeting, which was held to consider the training needs of local and regional planners in developing countries in the use and application of information systems and technology, presents both a report of the meeting and a summary of the proceedings. The meeting report includes a brief introduction, the conclusions reached and recommendations offered by the participants, and two course outlines a course on information systems planning for regional planning, and a course on information awareness training for senior managers in regional planning agencies and regional development projects. The report on the proceedings includes the welcome and opening address, as well as summaries of the presentations at 10 sessions and the discussion of these papers, and summaries of a general discussion and the closing session. Appendixes include lists of papers presented at the meeting, supplementary papers distributed at the meeting, and participants, as well outlines of the charge to each of three working groups and a list of its members, and a memorandum designed for distribution prior to the meeting. (CGD)

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Training in Information Systems for Local and Regional Planning

Report and Summary of Proceedings of
the UNCRD Expert Group Meeting on Training in
Information Systems for Local and Regional Planning in
Developing Countries, Nagoya, Japan, 16-19 June 1986

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TRAINING IN INFORMATION SYSTEMS FOR LOCAL AND REGIONAL PLANNING

Report and Summary of Proceedings of the UNCRD Expert Group Meeting
on Training in Information Systems for Local and Regional Planning
in Developing Countries, Nagoya, Japan, 16-19 June 1986

United Nations Centre for Regional Development
Nagoya, Japan

UNCRD Meeting Report Series; No. 18

United Nations Centre for Regional Development,
September 1986

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FOREWORD

At the end of an important activity such as the UNCRD Expert Group Meeting on Training in Information Systems for Local and Regional Planning in Developing Countries, the appropriate action now is to record the proceedings of the meeting. This report establishes the need for training in information systems and provides suggestions as to appropriate approaches for organizing training programmes and for promoting the development of information systems for local and regional planning in developing countries. The report also provides a discussion of the training issues in developing countries. Since many organizations have expressed interest in the meeting, we are making this report available now to stimulate further discussion. More detailed consideration of training needs will be provided in the Spring 1987 issue of the Regional Development Dialogue, which will be devoted to information systems for local and regional planning. This RDD issue will include selected papers prepared for the meeting.

We wish to briefly, but with deep gratitude, acknowledge the contributions of the concept paper writers, case study writers, discussants, and rapporteurs, without whom the meeting could not have been successful. It is clear that we have succeeded in bringing together a group of experts who generated new ideas and debate, and advanced the frontiers of our understanding of the problems in training planners in the uses and applications of information systems. Many ideas occurred not only during the formal presentations but also during the more informal discussions in smaller working groups.

The meeting has provided valuable guidelines on the necessary steps to implement UNCRD's proposed training project on information systems for regional planning in developing countries. More work is needed to develop a training programme that better matches the practice and concerns of regional planning in developing countries. The curriculum, content, style of instruction, format of programmes, and training materials should be appropriate to their needs. Fortunately, this appears to be a direction in which some training institutions and international organizations are already moving. UNCRD looks forward to collaborating with these institutions and organizations in carrying out this training project.

Hidehiko Sazanami

25 August 1986

Hidehiko Sazanami
Director, UNCRD

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PART I: REPORT OF THE EXPERT GROUP MEETING

INTRODUCTION

The UNCRD Expert Group Meeting on Training in Information Systems for Local and Regional Planning in Developing Countries has brought the training needs of local and regional planners in the uses and applications of information systems and technology under closer scrutiny than ever before in other international forums. Local and regional planning today is much more complex owing to the use of quantitative and qualitative techniques and the changing role of planning as an instrument of policymaking. So the information requirements in local and regional planning have increased.

A common theme of the meeting is the need for adequate training to harness information technology to enhance the quality of information for local and regional planning in developing countries. The meeting assessed the opportunities and limitations for training in developing countries and dealt with the practical question of how to make training in information systems and technology more effective.

More specifically, the meeting looked into how national and international training institutions can be mobilized in a common systematic, problem-solving effort to provide training programmes in information systems. It assessed the potential benefits of international institutional collaboration in establishing or strengthening training capabilities in developing countries, and in promoting the development of information systems for local and regional planning. It suggested ways of mobilizing professional expertise for providing training or technical assistance in developing countries. Furthermore, the meeting recognized the benefits of establishing training networks for the sharing of resources, training materials, and experiences, and users' networks for information exchange. From the meeting emerged proposals for training and research priorities and methods in the light of the case studies in developing countries.

Held 16-19 June 1986, at the United Nations Centre for Regional Development in Nagoya, Japan, the meeting featured presentations and discussions on the following topics: "Fundamental Issues to Include in Training for Information Technologies," by Linda K. Carlisle; "Varying Information Needs for Local and Regional Planning and Their Implications for Training," by Hiran D. Dias; "Training in Information Systems Design for Urban and Regional Planners in Developing Countries," by John Lindsay; "The Third Computer Revolution: Implications for Training in Developing Countries," by Marvin Manheim; "Information Management Training for Urban and Regional Planning," by Ian Masser; "Training Needs in Information Systems for Local and Regional Development and Planning in Developing Countries," by Peter Nijkamp; "An Integrated Approach to Training for the Establishment and Use of Information Systems for Subnational Development Planning," by K. V. Sundaram; "Information Systems for Urban and Regional Planning in India: MMDA Case Study," by A. Mohamed Ameen; "Assessment of Training Needs on the Use and Application of Information Systems for Local and Regional Planning in Pakistan," by A. S. Bokhari; and "A Case Study on Information Systems for Local and Regional Planning in Rapti IRD Project, Nepal," by Heera Raj Regmi.

The meeting closed with the presentation of the "Conclusions and Recommendations" of the Expert Group Meeting and the course outlines for an Information Systems Planning Course for Regional Planners and an Information Awareness Training Course for Senior Managers of Regional Planning Agencies and Regional Development Projects, by the chairpersons of the three working groups.

The UNCRD organized the meeting with the following objectives:

1. To determine the training needs of planners in developing countries in the use and application of information systems and identify the obstacles to the fulfillment of those needs;

2. To consider the current practice in relation to training issues, with particular reference to the kind of training and skills and knowledge required in designing and implementing information systems, the course content or curriculum, training methods and

strategies, and trainers for an appropriate training course on information systems for local and regional planning in developing countries;

3. To formulate a curriculum and identify the topics and components of modules for such a training course.

The meeting was attended by sixteen experts and three observers, of which five were from developing countries. Representatives from the United Nations Department of Technical Co-operation for Development, Development Planning Advisory Branch, the UNESCO General Information Programme Division, the International Institute for Aerospace Survey and Earth Sciences, and the Asian Institute of Technology, and selected UNCRD staff members also attended the meeting.

The meeting constituted part of Phase II of the UNCRD Research Project on Information Systems for Local and Regional Development. Phase II dealt with the training needs of local and regional planners in using and applying information systems.

UNCRD EXPERT GROUP MEETING ON TRAINING IN INFORMATION SYSTEMS FOR LOCAL AND REGIONAL PLANNING IN DEVELOPING COUNTRIES
16-19 June 1986
Nagoya, Japan

CONCLUSIONS AND RECOMMENDATIONS

1. Technological innovations in computer hardware and software and communications will have a catalytic effect on development planning and decision taking. Planning agencies and institutions are eager to adopt the new technologies, but a key constraint is human resources. There is emerging a substantial need for training and other human resource development activities to exploit this opportunity. International institutions have an opportunity — and a responsibility -- to stimulate the development of effective training programmes.

2. Information is generated, organized, and distributed at all levels of management in an uncoordinated manner and at considerable cost. Local and regional planning, and plan implementation, require information from many agencies including national and international, and generate information which can be of use to many other agencies. This failure in coordination leads to a significant waste of scarce resources.

3. Appropriate technology
There is a range of alternative approaches to using information systems in planning and development. In some situations, the most appropriate approach may be to develop large integrated data bases and computerized models. In other situations, the most appropriate approach may be to use rapidly developed simple methods and approximate data assembled quickly from a variety of sources. Careful consideration should be given to choosing the most appropriate approach in each specific situation. It is especially important that a range of such approaches be utilized in training programmes and in practice.

4. Need for lead institution

There is a need for a lead institution internationally to promote the rapid and widespread development of information systems for development planning and implementation. This should include activities such as: providing a centre for documentation, including software, training materials, case studies, and evaluations; taking a major role in information dissemination; and taking a major role in coordinating training networks and user networks. Appropriate supporting roles for supranational regional institutions should be identified. UNCRD should consider what role it should play in this respect.

5. Role of training

The need for training in information systems in the developing countries being now well-established, the right course for the countries in the region is to organize massive training programmes in their countries. The setting up of specialized training centres solely for imparting training in information technology is not necessary, as this would be costly, duplicative, and time-consuming to establish. The approach could be to establish such training programmes in existing centres which are imparting training in related fields such as national and area planning and sectoral management, public administration, and social development. The training centres should be formed into a network so as to facilitate exchange among them of information on applications and dissemination of training material. International agencies have a great role to play in establishing such a network and bringing about effective interaction among them.

6. Role of international institutions

Local and national institutions need assistance in developing training programmes. International institutions should provide assistance in a number of forms: they should provide experts to partici pate in curriculum design or in teaching; they should provide assistance in identifying and documenting case studies, in finding resources, and in establishing linkages with national governments, international networks, and industry.

7. Training network

A number of organizations are beginning to offer training programmes in information systems in development planning and implementation. A network of organizations involved in training should be established to enable these organizations to share resources, training materials, and experiences in order to develop effective practices rapidly. Such a network should be supported by a newsletter, annual seminars, and other techniques. High priority should be given to an early convening of training organizations and selected users to share experiences to date.

8. Users'/implementors' networks

There will be a rapid evolution in the use of information technology for development planning and implementation. It is essential that individuals and organizations developing and/or using information systems, have adequate opportunity to learn from one another's successes and failures. A user network should be established, including activities such as: newsletters, software libraries, document libraries, meetings, and professional associations at local and national levels. Professional associations such as the Urban and Regional Information Systems Association (URISA), the Australian Urban and Regional Information Systems Association (AURISA), and related organizations have been particularly effective.

9. Training issues

Training for information systems for development should include coverage of these major training areas:

a. Management - skills and techniques
b. Organization change - role of change agent, entrepreneurial and innovation skills
c. Development - social and economic development, planning and management of development, planning institutions and processes, and multilevel aspects of planning
d. Planning and project methods, models, and implementation, monitoring, and evaluation techniques
e. Information systems

   - (i) Understanding the organizational environment
   - (ii) Establishing goals
   - (iii) The economics of information
   - (iv) Information systems tools and capabilities
   - (v) Service delivery mechanisms
   - (vi) Effective provision of information systems capabilities

f. Personal skills and attitudes

g. Training, including the training of trainers

10. Industry involvement

Mechanisms should be established to involve the national and international information (computers and communication) industry in this effort. For example, a foundation could be established to collect financial contributions from information companies. Under the guidance of an independent advisory panel, these funds could be made available to support travel and/or training fellowships, for professionals in information systems for development.

11. Involvement of professionals in developed countries

Mechanisms could be established to draw on the professional talents of information systems professionals in developed countries. For example, the various national and international professional organizations (e.g., International Federation of Information Processing (IFIP), Data for Development International Association, and many others) could invite members to volunteer to spend 2-8 weeks teaching or providing advice in a developing country organization. This would, however, require extremely careful sensitizing, coordination, and cooperation.

12. Promoting innovations

Mechanisms should be established to recognize and reward particularly effective innovations in information systems applications in development. Recognition might include certificates of commendation, fellowships to training courses or to professional society meetings, publication in an appropriate journal or newsletter, etc.

13. Laboratories

Institutions (both training and implementing) should be encouraged to set up laboratories including equipment and software, to allow for experimentation in data capture, organization, processing, communication, and output.

14. Publishing

The publishing of software, catalogs, user newsletters, "bulletin boards," data bases, and documentation in a variety of media is now feasible. Alternative communications media include one-way or two-way via post, telephone, television, or radio (direct or via satellite). These alternatives should be assessed in order to evaluate possible international actions.

15. Research

Research is needed to develop and experiment with new approaches to the use of information systems in planning and development and especially in comparative analysis and evaluation of alternative experiences and techniques. Simple adaptation of present methods and techniques may not be the most effective approach in many applications. An expert group should be convened at an early date to develop alternative research strategies.

NOTE

The Conclusions and Recommendations have been prepared by Working Group III of the Expert Group Meeting (see Appendix 3), and have been accepted and endorsed by the participants during the Closing Session of the Expert Group Meeting on 19 June 1986.

INFORMATION SYSTEMS PLANNING COURSE FOR REGIONAL PLANNERS

Training Objectives

The main objective of an advanced information systems planning course is to train local and regional planners in technical methods regarding the design and use of information systems. More specifically, the course should pay attention to Information Management (IM) techniques and tools for regional planning. It is assumed that participants in this course already have a basic insight into information management and the use of computers.

Target Groups

The training course should address the following target groups:

- informatics personnel charged with the task of providing regional planning agencies with up-to-date and reliable information
- regional planners with a specific task in the field of urban and regional information systems design
- interested (potential) regional policymakers with a definite interest in informatics use for decision making.

In order to reconcile the interests of such a diverse group, careful preparation is necessary. In the context of this course, policy planning, strategic planning, and executive planning have to be taken into consideration in order to provide a comprehensive picture of the potential of modern information systems for a broad spectrum of regional planning issues.

Kind of Training Needed

It is clear that the course design requires some experimental phases, but in any case it is important to specify tentatively — by means of guidelines — the ingredients of this course. Of course, the contents may be adjusted after some initial experiences. For the moment, however, we will assume that it will be an intensive course of one month duration.

Three kinds of training modules should be prepared in order to serve the needs of an advanced information management course:

Module I. Computer Management Training
- I-1 Basic Course
- I-2 Analysis Course

Module II. Planning Method Training
- II-1 General Course
- II-2 Advanced Course

Module III. Exercises and Applications
- III-1 Demonstration Course
- III-2 Pilot Study

These ingredients are further elaborated in the next section.

Training Content

Module I. Computer Management Training

I-1 Basic Course (possibly to be organized in the participants' home country). This basic course serves to bring participants at a standard level in terms of information management and computer use. The elements are inter alia:

1) Computer Techniques (introduction)
2) Data Collection (e.g., software packages)
3) Data Checking by Basic Statistical Methods (e.g., standardization)
4) Output Presentation without Graphics (e.g., computer tables)

I-2 Analysis Course (Advanced Course on Computer Techniques)

1) Output Presentation by Means of Graphics (e.g., computer diagrams)
2) Basic Multivariate Analysis (e.g., correlation techniques)
3) Multivariate Analysis by Using Software (e.g., principal component analysis)
4) Mathematical Programming
5) Other Analytical Methods

Module II. Planning Methods Training

II-1 General course

This course gives an advanced introduction into the relevance of computerized systems for planning.

Its elements are:

1) Planning Theory and Computer Modelling (e.g., monitoring)
2) Diagnostic Analysis (e.g., gaming model, impact analysis)
3) Designing Analysis
4) Evaluation Analysis (e.g., interactive multiple criteria analysis)

II-2 Advanced Course on Planning Methods

This course should be provided along the lines of sectoral planning in small subgroups. Examples are:

1) Region Classification (planning region)
2) Resources Allocation (e.g., raw materials)
3) Environmental Planning (e.g., pollution management)
4) Transportation Planning (e.g., infrastructure)
5) Land Use Planning (e.g., agriculture)
6) Urban Land Use Planning (e.g., urban renewal)
7) Rural Land Use Planning (e.g., forestry)

Module III. Demonstration Course

This course serves to provide the participants with operational skills. Its elements are:

III-1 Demonstration Course

1) Planning Analysis (e.g., based on simulation)
2) Information Systems Planning (e.g., pedagogical example)
3) Data Collection (including sectoral plan information)
4) Diagnostic Analysis (checking of data)
5) Designing Analysis
6) Evaluation Analysis
7) Computer Science for Regional Planning (learning example)

III-2 Pilot Study from Home Country (elements to be prepared before participation in training)

1) Simple case study on specific information planning issue
2) Data use and computer storage

3) Analysis of results
This might also be based on experiences from developed countries.

Instructional Materials

For training module I:
- Standard material on computerized information systems
- Use of application package (e.g., SPSS) and others

For training module II:
- Advanced technical material on local and regional planning methods
- Statistical and modelling techniques
- Specialized training material for sectoral planning

For training module III:
- Standard manual for demonstration projects
- Structured guidelines for empirical pilot study

Most of the instructional materials should be prepared and sent to the participants prior to the courses, as otherwise this intensive one-month course cannot be realized. Good preparation on the part of staff members and participants is necessary.

Instructors

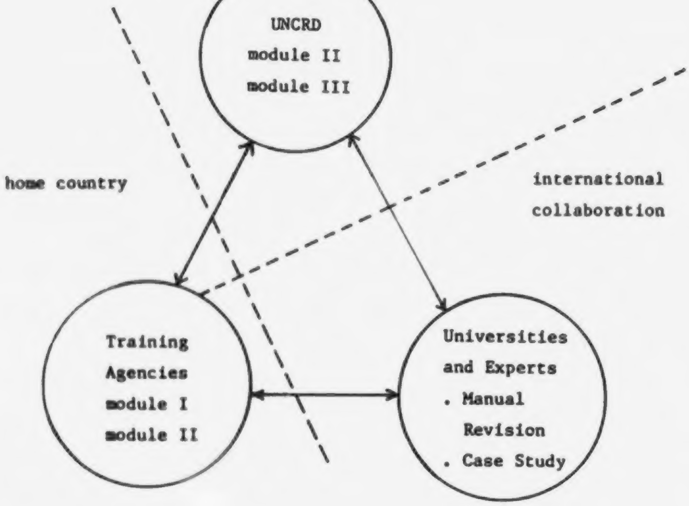
Part of the training course is in-house activity, carried out by UNCRD specialist staff and visiting faculty (including practitioners).

Another part of the training can be done in the home institution or in close collaboration with a specific country (including periodic regional meetings). This approach opens the possibility for a broader international network (see next section).

Proposal for an International Network

A broad international network can be designed, based on cooperation between UNCRD, the home institutions in the countries concerned, and the external expertise from different universities or planning agencies.

Figure 1. International Networking


UNCRD
module II
module III
home country
international
collaboration
Training
Agencies
module I
module II
Universities
and Experts
. Manual
Revision
. Case Study

In order to ensure the smooth functioning of such a network, a compatibility of computer softwares is necessary. In addition, the support of UNCRD and other international organizations will be necessary for the different international working groups.

Final Suggestions

a. The information training course should give due attention to the specific features and requirements of segmented regional planning sectors, focusing on coherence and systematics.

b. Monitoring of qualitative information (e.g., via expert systems) is a basic prerequisite.

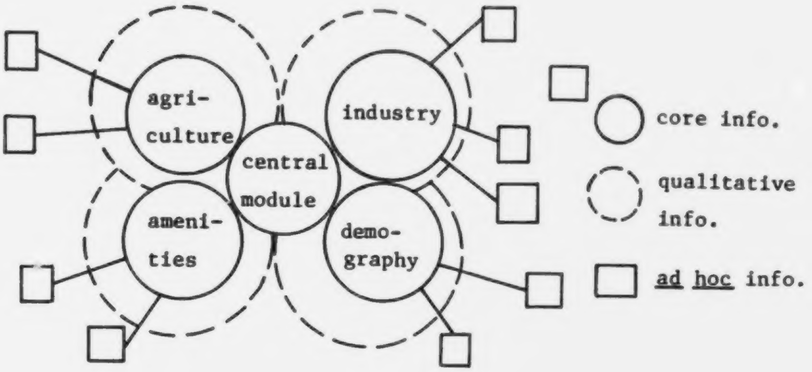
c. Interactive learning procedures on a computer (especially in the case of multiagency decisions) should form an important ingredient for such a course. In this respect, pedagogical demonstration projects are of paramount importance.

d. In addition to the design and use of information systems, the need for updating and maintenance should be emphasized.

e. It is also advisable to design demonstration projects which are geared towards public participation and information transfer "from the bottom" (e.g., via informal information channeling).

f. In order to cover a wide range of options in regional planning and to ensure future flexibility, a modular design based on a satellite approach may be useful, as indicated below:

Figure 2. Modular Design of Information Systems


agri-
culture
industry
central
module
ameni-
ties
demo-
graphy
core info.
qualitative info.
ad hoc info.

It has to be emphasized once more that the various training modules require a permanent adjustment, depending on needs and previous experiences.

NOTE

This course outline has been prepared by Working Group I of the Expert Group Meeting (see Appendix 3).

INFORMATION AWARENESS TRAINING FOR SENIOR MANAGERS IN REGIONAL PLANNING AGENCIES AND REGIONAL DEVELOPMENT PROJECTS

Training Objectives

The main training objectives of this course are to demystify information technologies and to emphasize the choices that are open to senior managers.

Given these objectives the course must be designed to provide both practical and theoretical information to participants with a significant emphasis on actually seeing technology at work and deepening understanding through case studies and sharing of experience.

The target group for such a course is senior managers in regional planning agencies and regional development projects who are the interface between the technicians who provide the services and the political environment within which planning operates. These senior managers are decision makers who have the responsibility for the corporate thinking of these agencies.

Course Design

It is envisaged that a course of five days in length will be required to meet the training objectives set out above. This course will include formal presentations and lectures but a significant proportion of the total time will be devoted to site visits and small group discussions. Participants will also be given the opportunity to obtain some hands-on experience with different computer systems.

Because of the importance that is attached to site visits, a major factor in course design must be the choice of a suitable location which provides examples of current best practice as well as the institutional infrastructure that is needed for course administration.

To provide a starting point for small group discussions in the course each participant should be asked to get his staff to prepare a short review of the state of the art in their agencies prior to the meeting. A checklist of six to ten topics should be provided by the organizers as guidelines for the preparation of these reviews.

The main constraints on the number of potential participants on such a course are the need to ensure that there is adequate provision for small group discussion and the extent of the computer facilities that are available to provide participants with hands-on experience. The optimal number of participants probably lies within the fifteen to thirty range but the capacity of the course can be increased by doubling up on site visits, group discussions, and practical sessions.

Course Outline

The precise curriculum of such a course will depend on local circumstances and the resources at the disposal of the organizers but it is likely that the following topics will be covered in a sequential way:

1. The role of information systems in regional development and planning: what is meant by information management, relationship between information and decision making, consequences of new technologies, incorporating information management in overall corporate strategies.

2. Computer literacy: range of information technology, mainframes and micros, hardware and software, and range of applications.

3. Information system planning: defining user needs, alternative information management, strategies, procurement, implementing information systems, building commitment and support.

4. Management implications: consequences for staffing structures and individual career development, training needs, laws and regulations governing information, and sources of technical assistance.

It is envisaged that less than half the total time involved would be devoted to presentations on these topics. The remainder would be taken up by the following items:

1. Presentations of case studies and site visits: in both cases participants should be encouraged to critically evaluate the information that is presented to them in the light of their own personal experience.

2. Small group discussions starting from the reviews prepared by the participants themselves: each group should be asked to prepare recommendations as a result of their discussions and to present them to a plenary meeting.

3. Hands-on experience with different computer systems: every participant should have an opportunity to work with a simple spread sheet package and either a geographic or statistical package.

An Illustrative Example of Such a Course

Day 1
a.m. Opening: the role of information systems
p.m. Hands-on exercise - spread sheet exercise

Day 2
a.m. Computer literacy
p.m. Case study I followed by small group discussions

Day 3
a.m. Information systems planning
p.m. Hands-on experience - geographic or statistical package

Day 4
a.m. Case study II followed by small group discussions
p.m. Site visits

Day 5

a.m. Management implications

p.m. Plenary session: small group reports

NOTE

This course outline has been prepared by Working Group II of the Expert Group Meeting (see Appendix 3).

PART II: SUMMARY OF PROCEEDINGS

WELCOME AND OPENING ADDRESS

Hidehiko Sazanami, Director, UNCRD

It is an honour for me to welcome you all to this rather unique meeting. The Expert Group Meeting on Training in Information Systems for Local and Regional Planning in Developing Countries is unique in the sense that the academics and practicing planners from developed and developing countries, as well as the UNCRD staff are participating in the meeting. The meeting should provide an opportunity for discussion and learning, because the ultimate aim is to generate information and opinions -- not to get one's own views confirmed, but to produce recommendations that can be transferred into policies.

Among the many issues to which you will address yourselves, an important one will of course be the training needs in information systems for regional planning in developing countries. There are certain difficulties inherent in the subject of regional planning which makes difficult, description and analysis of the needs of regional planners. The meeting must necessarily deal with evolving issues as well as with problems in regional planning in developing countries.

Regional planning tends by tradition to overemphasize the scientific or technical aspect, whereas the administrative aspect is less emphasized. It must be kept in mind that regional planning is not a purely scientific or technical task, but an administrative task requiring a high degree of political legitimation and support. This means that regional planning must contribute to a better coordination of all the decentralized decisions and activities of many different persons and institutions in accordance with development objectives in a specific region.

Regional planning is a continuous process comprising a variety of planning tasks and outputs. This task requires a systematic and continuous collection, processing, analysis, interpretation, and dissemination of information which may help regional planners in the planning process (i.e., reconnaissance, analysis, elaboration of alternatives, decision, and implementation) and other institutions in making useful and coordinated decisions. The application of information systems in regional planning will result in valid and accurate information and improved planning capability.

A central problem facing the regional planners of developing countries in undertaking their task is the development of a suitable organizational structure and procedures for information systems. The principal obstacles are the shortage of suitably trained regional planners and the regional planners' lack of familiarity with the nature and applications of information systems. It is therefore necessary to train regional planners as well as strengthen their awareness and knowledge in the use and application of computer-based information systems, so as to improve the quality of regional plans and planning decisions.

Regional planners need to be aware of the new information services and see how these relate to planning concepts and how they can improve their planning techniques. The new information services are:

1. On-line data bases and electronic publishing. These are on-line systems developed as a real-time service via computer bureaux. Examples are on-line publishing, such as in-house and commercial statistical data bases and bibliographic data bases.
2. Microcomputers used as terminals for on-line data bases.
3. Microcomputers used for many software packages as an aid to planning. Examples are packages or spread sheets for financial modelling.
4. The concept of the microcomputer as a work station and information centre. Examples are distributed information systems linked by local area networks.
5. Networking and electronic mail used to obtain and exchange information. The techniques for networking are computer conferencing, video conferencing, electronic mail such as videotex and teletext, and technical and social networking.
6. Computer-aided design packages for planners.
7. Expert and knowledge-based systems based on the work of artificial intelligence, and other decision aids and modelling techniques for planners.

8. Automated mapping and geographic information systems. These systems can assist planners in mapping and geographic analysis activities. They may consist of limited function drafting systems built around interactive graphics systems, or very sophisticated graphic and analytical systems, capable of a wide range of attribute processing and geographic analyses along with even more powerful graphics functions.

The concept of information systems utilizing advanced technology has been welcomed by the Seventh UNCRD Advisory Committee, which has called for its possible implementation in both the Centre's training and research activities related to the methodology of regional development and planning. A key question, however, is: How can training and research in information systems be specifically designed to meet the needs of regional planners in developing countries?

It is hoped that the distinguished participants in this meeting will bring fresh perspective to the issues raised in both the research proposal of Phase II of the UNCRD research project on information systems for local and regional development and the aide memoire of this meeting. Let me, by way of reminder, mention the training issues:

1. What kind of training would be needed in:
    (a) Designing information systems for local and regional planning (i.e., preparing a design for the information system, specifying information requirements, data collection and validation, processing, analysis, and interpretation, and information dissemination);
    (b) Monitoring and evaluation of local and regional plans and projects;
    (c) Managing and using information systems for local and regional planning; and
    (d) Sensitizing or familiarizing planners with information concepts, information-handling skills, and information technology.
2. What should be the course content or curriculum for an appropriate training course on information systems for local and regional planning?

3. What training methods, strategies, and instructional materials would be needed to provide or deliver both formal and nonformal instruction?
4. Who should be trained?
5. When should training be provided?
6. Who will undertake the task of training the regional planners?

The concept papers and country case studies which a number of participants have prepared as a basis for the discussions of this meeting, provide a framework for analysis of these issues.

The concept papers are: Fundamental Issues to Include in Training for Information Technologies, by Linda K. Carlisle; Varying Information Needs for Local and Regional Planning and their Implications for Training, by Hiran D. Dias; Training in Information Systems Design for Urban and Regional Planners in Developing Countries, by John Lindsay; The Third Computer Revolution: Implications for Training in Developing Countries, by Marvin Manheim; Information Management Training for Urban and Regional Planning, by Ian Masser; Training Needs in Information Systems for Local and Regional Development and Planning in Developing Countries, by Peter Nijkamp; and An Integrated Approach to Training for the Establishment and Use of Information Systems for Subnational Development Planning, by K. V. Sundaram.

The country case studies are: Information Systems for Urban and Regional Planning in India: MMDA Case Study, by A. Mohamed Ameen; A Case Study on Information Systems for Local and Regional Planning in Rapti IRD Project, Nepal, by Heera Raj Regmi; Assessment of Training Needs on the Use and Application of Information Systems for Local and Regional Planning in Pakistan, by A. S. Bokhari; Assessment of Training Needs on the Use and Application of Information Systems for Regional Planning: Case of Integrated Rural Development Programme in Sri Lanka, by P. S. Ramakrishnan and W. M. Leelasena; and Training Needs on the Use and Application of Information Systems for Local and Regional Planning in Kenya, by Rachel N. Musyoki.

We urge other participants to ask questions and generate new ideas on the training issues. We need the best possible advice to evolve proposals on training and research in information systems for local and regional planning in developing countries. We see this meeting as an important contribution to that objective. We are pleased that you were able and willing to accept the invitation to attend this meeting. We have the good fortune of having with us, some participants of the 1984 Kawasaki International Seminar on Information Systems for Urban and Regional Planning. This meeting is a follow-up of the Kawasaki Seminar, which stressed the need to assist developing countries to upgrade the effectiveness of planners through the provision of appropriate training programmes in information systems.

I wish you all success in your deliberations. I will follow the proceedings with the utmost interest. It is a pleasure for me to declare the meeting open.

RAPPORTEURS' REPORTS

SESSION 1

Monday, 16 June 1986, 10:45-12:00 hours
Topic: Training in Information Systems Design for Urban and Regional Planners in Developing Countries
Speaker: John Lindsay
Discussants: Peter Corbin
Takeshi Arai
Chairperson: Hidehiko Sazanami
Rapporteur: James F. Goater

Having noted the multidisciplinary nature of the subject matter, and the difficulty of producing the paper, John Lindsay gave a brief background description of the nature of the material he was presenting.

The subject, "Training in Information Systems Design for Urban and Regional Planners in Developing Countries," goes to the centre of four separate disciplinary traditions: (i) Information Technology (IT); (ii) Information Systems (quite separate from IT); (iii) Discipline of Training (UNCHS, EEC, etc.); and (iv) Specific Problematic of Developing Countries.

IT moves as far as computer science, very far from planning problems of developing countries, nevertheless there is some relevance to the latter.

Lindsay notes the importance of realizing that work in developed countries has relevance to developing countries, i.e., appropriate technology means crude technology.

"Development" is a euphemism, hiding its real meaning. In the 1960s perhaps we did mean a general, expanding, world economy. But now, even within UN organizations, it is clear that the world economy is not continually expanding. There is limited/finite resource. Development means "change." Development is going in reverse (e.g., 20 per cent unemployment in some parts of UK, with entire destruction of industrial base).

Development must mean "management of change." The world recession means questions have arisen as to the value of planning in the first place. (Lindsay cites "Thatcherism" which says everything can be left to the marketplace.) The market is the only information system required and policy should aim at freeing the market in order that developing market forces will facilitate the development of the economy.

The third idea arising out of the developing countries is the concept of "country" itself. Due to uneven development, a country is not a coherent whole. Definitions of countries are not necessarily helpful.

(Referring to the diagram of four overlapping disciplines, Lindsay then notes that despite convergence of some aspects of the four, the historic division between the scientist/engineer and the social scientist appears.)

Development planning (social science)	Faculty of Engineering (information science)

As information systems designers, we are stuck in the middle, because we must create a bridge between the two. To develop training, integrating information technology, architecture, geography, social science, civil engineering, etc., and create a bridge for these disciplines to communicate, is very difficult. We may end up performing no useful function whatsoever.

Lindsay's paper goes on to identify five categories of personnel for training. (He believes training must be specific.)

(1) Technical and clerical operators:

The speaker argues that these are the people who should understand what a project's content ("inner trajectory") is all about. Their training is expensive and time-consuming, yet without their understanding, the project will fail because they cannot adjust to the project's implication. (For example, keyboard operators must understand what they are keyboarding in order to monitor errors.)

He suggests this training can be done in-house/in-country. He also suggests that these workers should be given opportunities to progress in their careers, to progress intellectually.

(2) First-degree, undergraduate professional level

(Lindsay provides an example of his own institution's training course -- a four year programme)

First and second year concepts	(i) Any IS has to function; (ii) Has to be economic; (iii) Has to be beautiful (elegance, simplicity)
Third year	Students work in industry/government designing an actual information system.
Fourth year	Students produce thesis.

Lindsay takes the view, however, that an undergraduate degree should be in more general-based work rather than vocation-based training.

(3) M.Sc. - further degree level

Specific vocation training is possible, and particularly is to be done outside of the home country. Lindsay warns against the danger of Ph. D. directly after M.Sc., saying this produces full-time students, paper producers, people who have done no real work. There is value in taking people in mid-career.

(4) Mid-career professionals

These are people who have worked themselves into the narrow part of their career and can no longer see how the whole thing fits together. (The difficulty lies in time constraints for this level of trainee, as no one could afford a whole year.) Lindsay suggests a three-month training course and voices his hopes that the meeting would be able to put together a detailed syllabus in the time allotted.

(5) Training policymakers. Lindsay notes that the most difficult task is training policymakers. There is a functional contradiction here -- information systems designers are talking about IS in a world which is not systematic. Perhaps all that can be done is to indicate the contradictions which will result from various policy decisions.

Strategic Information Policy (STIP) — developing out of high technology influence on IS. A relational view of data has developed, in relational data base (A structured system for designing is emerging)

The institutions necessary for STIP are worthy of study. The question is: Who should be trained for this sort of thing? We are still at experimental stage. There is no large body of knowledge available.

The rate of technical change and social change is extremely great — no one knows what planning or policy will be necessary to improve the people's well-being.

Lindsay concludes by saying that he suspects that there is no agreement even on what "well-being" of the people looks like.

The first discussant, Peter Corbin, presented his views. He first notes that the comprehensive paper is dealing with training from the supply side — what sort of training can be provided, whereas the discussant is familiar more with training from the demand side, i.e., what kind of training is needed by governments of the developing countries.

Corbin therefore focuses on the kind of training in information systems required by governments, viz., middle-and senior-level professionals.

The demand side which is most urgent in training for regional development planning is in the area of monitoring and evaluation. In his experience there is great need for effective analyses of project outputs, ongoing, ex-post evaluation (macroeconomic impact). No country seems to have a monitoring and evaluation unit. What monitoring and evaluation is done, is usually manual in nature; little or no systematic computerization has been undertaken.

From the managerial side, there is a need to identify actual functions of individuals concerned and to establish a monitoring and evaluation unit.

Training personnel would come from this unit. The objective of the information system should be determined -- i.e., budgetary requirements, and identification of new projects. This is the area which needs attention.

The next discussant, Takeshi Arai, bases his comments on the training experience of UNCRD (in conducting the international training course in regional development planning). He notes that the course contains a microcomputer component but is targetted at planners from many levels, junior, middle- and senior-level, and underlines the desirability of having two separate courses.

IS for local and regional development planning has three subsystems: (i) Collection; (ii) Processing/Analysing; and (iii) Output/Dissemination (citizen participation).

(i) The training course takes into account collection (input) and processing, but should we not also take into account the third subsystem?

(ii) Designing information systems for local and regional development is very closely related to the planning system itself. Should this system, or to what extent should this planning system be taken into account?

(iii) The improvement of IS should combine introduction of new media equipment and the enrichment of old media systems (existing networks). Which is most important?

(iv) To the developing countries the cost of introducing IS is very important. How to teach the effectiveness of such systems, is an area which needs careful attention.

(v) How should one overcome resistance to computer technology? Perhaps by field visits, and personal usage of advanced computer.

Questions

Nijkamp: Wishes to raise a question concerning generational problems. Young people entering the professions full of ideals are confronted with older upper-level members of the establishment who view information systems as only of limited relevance. He suggests small pilot projects to demonstrate the value of high technology IS, rather than large-scale computerization schemes.

Bokhari: Emphasizes the need for integration between management system and scientific and electronic engineering systems to be developed for the benefit of the users. Outlines the trend towards vast data collection by individual agencies, and the need for design of system to eliminate duplication. The IS must answer questions of the planners which touches the social management side also.

Kitamura: Mentions the "bridge" mechanism outlined by Lindsay and asked what kind of categories for these bridges -- one or many?

Diaz: Question as to target people for training. Seeks clarification as to which level is being discussed at this meeting?

Sundaram: There are additional target groups apart from policymakers; and how would "bridges" between social scientists and engineers be developed through training?

Lindsay's response

By way of illustration, and aiding his answer Lindsay describes the Sri Lankan "Million homes project" with which his institution is involved. He asks the meeting to imagine the kind of information system necessary to ensure that the World Bank gets its money -- with each family paying 10 rupees a month for twenty-five years. The information system was not well designed -- even now the implications are only just beginning to be realized.

From this example, Lindsay concludes that the sorts of strategies which the meeting should look to are always to identify: (i) where the problem is most clear, and (ii) where the problem influences the receipt of money. (Only when improved financial benefits can be demonstrated as resulting from improved IS will the more senior people be convinced of the value of IS.)

Lindsay sounds a note of caution that increasing the flow of funds into government also equals the increasing flow out of the poor. This shows the contradictory nature of information systems design.

In response to Kitamura, "Where should the first bridges be built," Lindsay considers the young professionals should be the first target (the people who are most open to change).

The computer, rather than IS per se, is a good agent for creating insecurity among senior management. Lindsay notes the drastic change in five to ten years as more and more senior-level personnel took up keyboarding. Ease of use plus low-price products facilitated this change. However, Lindsay is against the training of senior management as he regards it as too late. The younger people should be the target group.

Lindsay cautions once again, against training people to be technicians or abstract theorists and emphasizes the importance of practically-oriented training.

He agrees with Arai's comment regarding the enrichment of old technologies. We must create an evolutionary design method, from the information infrastructure which exists already, to the small incremental improvements which improve the flow of funds into government, thereby increasing the efficacy of administration.

Lindsay concludes his summing by sounding the warning note that planning must include the wishes of the people. If the planners do not include people's participation, then the people usually are able to find effective ways to smash the system ("the spanner in the works").

SESSION 2

Monday, 16 June 1986, 14:00-15:10 hours
Topic: Information Management Training for Urban and Regional Planning
Speaker: Ian Masser
Discussants: A. Mohamed Ameen
Monte Cassim
Chairman: Hidehiko Sazanami
Rapporteur: James F. Goater

Ian Masser notes that his paper closely follows on from Lindsay's; he says he wishes to raise further questions about the type of training which the meeting needs to consider.

First, however, he provides an illustration to support his view that the principal problem facing developing countries, regarding IS is exactly what to do with the new technology which is available. In Lesotho, for example, a new microcomputer is to be installed, but the chief planning officer had (i) no idea what to do with it, and (ii) how he could obtain the trained staff to operate it. Thus the shortage of middle- and junior-level operators is acute.

Masser then refers to his blackboard summary of his presentation which begins with the groups of people who need training:

(i) Senior management and policymakers -- these are responsible for major decisions (increase in awareness is needed; IS is ineffective without their understanding/commitment).

(ii) Middle and junior management - these are people working directly with the equipment/high technology systems (broadening of experience, perspectives, and IT skills development are needed).

(iii) Information course organizers -- these are a new breed of individuals who can combine planning experience with IT skills -- reiterating Lindsay's point -- in the context of rapid change.

Masser next underlines obvious constraints, viz., time.

Group (i) Two to seven days only, is their availability, also there is the necessity to take the training to the people, rather than the opposite. In terms of group (ii) there are slightly less constraints. Nevertheless only two to three weeks could be envisaged. For group (iii) the time possible is between three months and one year.

Masser said that more detailed attention, now needs to be paid to course content and training needs. He then refers to his paper which contains specific examples of training courses currently being conducted with reference to the checklist prepared on the blackboard.

(i) There are common themes for senior management and policymakers: firstly the laws and regulations governing information. Awareness of legal restraints is necessary for this group. Secondly, training availability, what can be done; thirdly, acquisition of knowledge of various information strategies; fourthly, what national/international assistance is available (the danger is not making fullest use of experience). These four areas apply to politicians/upper-level management.

(ii) Themes relating to senior managers include the following:
Design, implementation, and evaluation questions.
What are the requirements of the organization?
What are the current hardware/software developments?
What is the extent of possibilities, what is the range of capabilities?
What problems are likely to arise in installation?
What will be the effect on the existing structure, what will happen? (status, departmental friction, etc.)

He refers to an example of a seven-day course run by UNDTCD in Sweden, involving case studies, visits, etc. using the country as "best practice" example.

As an additional example of less traditional training in terms of taking the training to the managers, Masser refers to an example of a "caravan" travelling around Britain showing current developments in IT, organized by the Department of Trade and Industry -- short (day/½ day) course for senior managers, round table discussions, etc.

Self-learning packages in disc form, can be separate from training courses. Transportable programmes are possible. There is a wide range of possibilities.

Moving on to middle- and junior- level management, the speaker says his comments will be restricted to monitoring and evaluation, because these tasks highlight issues of information system design (ISD), such as data collection, processing, and information management.

ISD courses must look at management and organizational questions (broad) and then at some technical questions affecting IS (specific). Monitoring activities involve translating general goals into specific measurable indicators. Organizational structures have importance for how information management may be approached.

Technically-oriented issues:

(i) problem definition - to check ongoing projects (measurable)
- to identify new problems

(ii) data collection - planners do not collect data, secondary sources are used, consistency problems arise.

(iii) information management issues - efficiency/"small is beautiful" etc., conflicting styles of approach to monitoring and evaluation.

(iv) reporting procedures - feeding the information to the people who matter; reporting requirements.

These needs should be considered in training requirements.

There are two approaches to these requirements:

(i) courses (teacher-pupil relationship)

(ii) workshops (exchange experience) (two different philosophies)

There are two different types of programmes:

(i) no practical dimension

(ii) practical component (considerable pre-course costs) (skill acquisition)

Masser then provides various examples of workshop/practical training.

Finally the speaker arrives at the training of trainers/course organizers. He notes that this is interdisciplinary, and involves planners and information specialists. We should be building bridges between the two. He suggests that the planning aspect is the most difficult -- planners should acquire information skills to bring this into organizations. (He provides an example of a course oriented in this direction.) He feels that one year is desirable for this sort of course, but that discussion would be valuable.

A. Mohamed Ameen focuses on the "training of trainers" as the central issue. He says that experts in IS do not fully understand the target group. (Course designers sometimes fail to appreciate this.) He calls for more discussion on this issue as he considers this to be of prime importance.

Secondly, he mentions the problem of transporting training packages. He refers to the Urban Data Management Software devised by UNCHS. Unfortunately it was designed primarily for senior managers and policy-makers, so that the benefits were missed, to a large extent. There is importance in matching course with target group.

He suggests a trained consultant should spend up to one year with the organization which is to implement a given system, to provide consistency. (The system has been tried in the Madras Metropolitan Development Authority.)

In giving a brief account of his organization he then illustrated how the above approach facilitated the training of middle- and junior-level officers who gained an understanding of systems development.

He feels that senior-level managers and policymakers can be involved at appropriate times in order that awareness is heightened.

The monitoring and evaluation system, when just installed met with resistance from upper management, but after four to five years of implementation its worth was proven and management has now agreed on computerization.

Finally he touches on Masser's point that planners should be trained in information technology. He is sceptical due to the speed of change in IT. Nevertheless he agrees on the notion of interaction between planner and information technologist. He urges the meeting to discuss further details in the course of deliberations.

The second discussant, Monte Cassim begins by noting the overlapping areas, i.e., levels of training, between Lindsay's and Masser's papers ("Great minds think alike").

He is impressed by the specific examples of training courses provided in the paper.

The fundamental question seems to be (arising from the deliberations so far), "Why is the introduction of IT necessary?"

He considers the distinction between IS and IT to be particularly useful, and states that by a thorough examination of existing information systems, correct decisions regarding the introduction of new technology can be made.

From Masser's paper he concludes that an understanding of the decision making environment is essential for introducing IT and adds that an understanding of the state of the art of IT is a second prerequisite for assessing its introduction.

(1) Regarding the understanding of the decision making environment, he makes several observations. First is the segregation of information catchment areas (e.g., departmental chauvinism and secrecy). The discussant then produces an illustration, showing firstly an integrated, hierarchical system which is what is considered ideal, then a sketch of a series of overlapping information systems which could function under a balance/check mechanism. This is perhaps a better model.

He uses the million houses scheme in Sri Lanka as an example, noting that an earlier scheme, the 100,000 houses, had largely been successful because it relied on the latter information system whereas the ongoing million houses scheme seems to be using the former (the latter is a decentralized information system).

(2) Secondly (in understanding the decision making environment), we should recognize that there are two types of information: (i) informal, which includes face-to-face exchanges and information exchange based on trust and mutual benefit; (ii) formal relying on technology-based systems. Both should be taken into account when showing the use of information systems.

(3) Utilization of output. Dissemination methods should be closely examined. Assuming that it is better to expand a given information catchment area, questions should be asked as to how this should be done. (Cassim allows that his perception may be wrong.)

He notes that one difference between developed and developing countries is that the extent of the information catchment area, at least with regard to the national economic system sometimes exceeds the geographic territory. In developing countries the reverse is true. (He underlines his case for the expansion of the information catchment area.)

The second subsection relates to understanding the technology; awareness of the tremendous revolution which has been wrought by the sheer affordability of microtechnology. Absorption of information technology by developing countries may determine whether or not the gap between rich and poor nations is narrowed. In Sri Lanka, costs of disseminating a microelectronic programme amounted to Rs120 (¥1200 or US$9) per household per year. The budgetary capacity of the Sri Lankan government was Rs200. He notes that the expatriate system allows huge infusion of computers via the wealth being accumulated abroad (150,000 workers in the Middle East).

He also notes that information technology has come before the knowledge of how to use it. Computer science has been brought out of the "ivory tower." "Proletarianization" of an "elitist preserve" will have great implications for the future.

There is no reason why developing countries cannot benefit, as time and manpower are abundant. Changes in the social structure as well as the education system will also result.

Questions

Noda responds by asking how to classify "needs" of particular end users. (He is involved in devising training courses.)

Manheim wishes to elicit Masser's views on "training the trainers" -- Was the speaker referring to merely training them once or subjecting them to a continuous process, so as to be "change agents?"

Lindsay continues on from this by saying, should we then be asking how are we training ourselves? (He assumes the participants see themselves as change agents.)

Carlisle focuses on Masser's workshop idea, and seeks clarification: Was he referring to action training? She has grave doubts about the value of this method.

Van de Putte asks about the use of information in decision making and its relevance, particularly to senior managers and policymakers. From his experiences in Indonesia this area seems of particular importance.

Bokhari comments on the difficulty of training senior-level managers and policymakers. They are nontechnical and likely to remain so. To design such a short course (two to seven days) he says, seems impossible; he asks whether or not the end users of information should be trained.

Lindsay notes the importance of aid/funding agencies shifting their emphasis away from mere crisis management and towards institution-building. Long-term financing is needed for training programmes. Information system can only develop over the long-term.

Kitamura asks if the speaker has any good ideas involving teaching the rules and regulations of information. How do you train teachers in this difficult subject?

Masser's response

Regarding the training of trainers/ourselves, as change agents referred to by Manheim and Lindsay, Masser refers to a book published by the British Urban and Regional Information Systems Association. "Information Systems for Policymaking in Local Government" is a collection of papers by planners and practitioners on the application of their own changing perceptions. It is a good example of how "change agents" can continue training themselves. (He notes the technology section of the book is already out of date.)

In discussing workshops, referring to Carlisle's comment, he admits the "circular discussion" method can be nonproductive -- but provides examples of high-powered action-oriented sessions which can be of immense help.

In response to Noda, the speaker admits his comments on "needs" were greatly simplified and that the classifications in his paper were only starting points, to cope with specifically defined needs.

To Bokhari's question regarding the difficulty of designing short courses for senior management and policymakers, Masser insists that short programmes can be designed, and that these people will be slow to adopt IT. (Typists are quick to adopt new technology, senior managers are not.) Once high technology information systems have been demonstrated as useful/profitable, the courses can succeed.

In response to Kitamura, the speaker outlines his ideas regarding the rules and regulations governing information technology/systems. He mentions the importance of building such factors as privacy and confidentiality into the system. He describes the Dutch census which was sabotaged by the people because there was insufficient trust in the system.

Finally, in agreeing with Cassim's diagrams -- the changes in information systems -- he underlines the changes being wrought by microcomputers. (They doubled in usage in UK planning agencies between 1982 and 1984.) There is a great expansion at a personal level in terms of computer literacy -- but it is important not to be overawed by elaborate data base systems and on-line networks.

SESSION 3

Monday, 16 June 1986, 15:20-16:30 hours
Topic: Training Needs in Information Systems for Local and Regional Development Planning in Developing Countries
Speaker: Peter Nijkamp
Discussants: Hiran D. Dias
Nguyen Tri Dung
Chairperson: Hidehiko Sazanami
Rapporteur: James F. Goater

Peter Nijkamp begins by quoting from a book called "Catastrophy Theory," and purports to show that the present meeting very much carries on from the Kawasaki and Visakhapatnam seminars. In this, the third such meeting, a kind of missionary zeal, in communicating the results, would be understandable.

He, nevertheless, cautions against too much enthusiasm, outlining some problems:

There is a danger of repeating earlier mistakes of the 60s and 70s, when more interest was generated by theory than actual regional problems. Now, there is the possibility of planners being dazzled by sophisticated models and information systems without relation to the real world (elegant models being more satisfying). There is the additional danger that less interest exists in the institutional mechanisms behind implementation systems, than in the systems themselves.

The main challenge is not to train people in information collection, data monitoring, etc., but to orient them toward their actual use in strategic policymaking. (Speaker is not worried about countries which have abandoned the census!)

The list of contents: (a) Information systems: (i) information (shipment of information), access to information -- major bottleneck for planning and policymaking; (ii) different features, i.e., flexibility, speed, ease of communication (economies of scope). (A basic training component in this regard would be to spell out the advantages of such features, clearly.) (b) Strategic policy analysis - includes judgement criteria necessary for information systems use (Availability, versatility, relevance, etc.). Management criteria - includes "orgware", e.g., organizational aspects of management (getting the right people in the right place at the right time). This is important for decision-support systems. (c) Training policy — produces small-scale pilot projects -- concrete approach based on specific area studies (Nijkamp suggests the UNCRD could adopt this approach.) There are two types of training policy: (i) Macropolicy - (manpower and labour market); and (ii) Micropolicy - (institutions and training personnel). Both have to be complementary (broad and narrow approach).

Training should not only concentrate on the supply side, but also on the demand side — how can information needs/flows by reconciled? All aspects of information cannot be incorporated into one system — core data must be established in terms of strategic policy objectives. This is one approach to data collection for pilot studies for training needs.

The second part of Nijkamp's paper deals with geographical information systems which are discussed in more detail. These are generally more advanced in both developed and developing countries. Good examples abound in the literature. (Case studies are presented, from Indonesia, Sri Lanka, Colombia, Kenya, etc.) Nijkamp focuses on four issues: (i) Ways of data processing/collection; (ii) Technology used; (iii) Updating methods; and (iv) Potential and prospects of systems. There are very interesting results of these systems, mixed results.

This leads to the conclusion that the success of any training in information system depends not only on technical skill (how the system initially operates), but also depends on ways of maintaining and financing a given system once it has been designed.

The speaker notes that in the long annex of his paper the five case studies are discussed in detail according to the four previously described criteria. The overview contains technical details, hardware used, training provided (here Nijkamp acknowledges the work of meeting participant van de Putte, ITC, in this regard).

Regarding the use of geographical information systems, much emphasis needs to be placed, in training, on the versatility of such systems, and their multipurpose nature. Attention should be given to the design and maintenance of a solid data base, particularly with geographical information systems (collection, storage, and analysis).

Institutional and management structures determine the way in which information systems are going to be utilized, while the importance of decentralization is evident.

Finally the speaker arrives at the conclusion of his analysis, which he briefly provides for the meeting: (i) Correct maintenance, or updating of existing hardware and software is essential; (ii) New releases of systems must be installed by the supplier — contracts are advisable, changing requirements, where necessary must be adopted by people within the organization if possible; (iii) Technical support by supplying agency must be available — the data base must be maintained; (iv) Available funds are frequently the determinant of success or failure of an information system. Regular funds release is very important after the initial outlay of costs for installing a particular system. Sporadic funding is detrimental for any information system; (v) A self-supporting educational system has to be realized. Users must know about information-processing potential, retraining is needed to accommodate new developments, and feedback is essential. Education in high technology skills is advisable for a suitable few. (Consumers become producers of data themselves.) Trainers should be trained to induce multiplier effect and to reduce dependencies.

Nijkamp then sums up his presentation by stating that effective urban and regional decision making can be greatly assisted by modern information technology both in terms of data generation and communication improvement between planning personnel. Implementation of a system should be fully embedded in the administrative system of a city or region — permanent training and education of all people involved must be given great emphasis.

The first discussant, Hiran Dias, says he is impressed by the length and breadth of Nijkamp's paper. Many variables which need to be taken into account are discussed. His own paper concurs with much of Nijkamp's, however he wishes to make some comments on areas where there are disagreements.

Information is not becoming important, it has always been important; what is happening is that greater and greater quantities of data need handling. With growing decentralization the level at which planning must take place is getting lower, such that volumes of information are "stupendous."

Referring to the Sri Lankan paper (by Ramakrishnan and Leelasena), Dias acknowledges the scale of data collection for one district during a Sri Lankan case study (individual data from 11,000 households).

The perspective/perception of development itself is changing, which imposes new information requirements at different levels. Greater specificity is required on the nature of the decision maker himself (abstract concept). A great variety of groups is involved. Distortion sometimes occurs due to different people. Information must be tailor-made for these kinds of people. (It is a challenging task to extract relevant information to facilitate multilevel decision making and planning.)

Standardization and coordination in the information system become important, to minimize collection of different sets of data. An advantage here is the new technology (micro/personal computers); training is necessary for low-level personnel who can do this kind of work.

In a Sri Lankan example, subdistrict personnel can be trained at AIT (Bangkok) for a one-month training course in the use of software/hardware. As yet the most appropriate training has not been evolved.

Another aspect of great importance, highlighted by Nijkamp, is the question of organization "orgware." Organization is an obstacle to adequate coordination, i.e., how to make the relevant information available at the relevant level. Correct implementation of the new technology may surmount these obstacles but in some cases (i.e., Sri Lanka) each department seeks its own hardware, not necessarily compatible with each other, and the same organizational problems remain. Higher level training should include emphasis on compatible equipment installation. The discussant outlines a Sri Lankan case whereby district personnel were trained, they then trained subdistrict level officials who in turn trained field level workers -- in successively shorter training periods. Much of the data was collected by the latter, who had also been taught to process parts of it. There was high level of motivation observed, throughout.

Nguyen Tri Dung, the second discussant, modestly notes that Nijkamp's paper is too comprehensive for him to discuss; however, he has a few points to raise. Firstly he assesses that by reading the paper, any planner in the developing countries would be convinced of the critical value that information systems can play in planning and management of regional development. He seeks clarification on a few issues, "reading between the lines." What is meant by information? -- there are many variables, many interpretations. What is the appropriate planning information necessary for more effective planning?

What are the main differences between developing and developed country information requirements? -- noting that part of the Kawasaki declaration included a clause counselling against the large-scale installation of Western systems in the developing country context. He notes that in many planning contexts within the Asian countries, there is a very evident shortage of data.

Training in information systems should not be separated from training in regional planning, for time constraints do not permit two courses. Some kind of combined approach is desirable.

What is the appropriate training method in this field? Nguyen then outlines the computer gaming simulation planning exercise which UNCRD is utilizing. Self-learning, exchange of experience takes place. This appears to be the kind of pilot project which Nijkamp has discussed, and can be used as a demonstration.

Nguyen expresses concern about maintaining, financially, many courses at very many separate levels. Is cost-benefit analysis necessary here?

Finally he concludes by intimating that the lessons of experience learned by the developed countries should be given particularly close attention by the developing countries.

Questions

Kitamura seeks clarification between "Regional" and "Local." He notes great many factors differentiating them. Maybe two information systems are necessary for planners.

Regmi describes the process of data collection for plan formulation as it takes place in Nepal. Enormous difficulties are inherent due to geography, backwardness. He would like Nijkamp's views on how coordination between the sectors can be improved.

Nijkamp's response

Nijkamp notes the whole range of questions, and mentions his sympathy with most items. He notes the need for more information, as uncertainties and risks and costs of wrong decisions are astronomical. This is why information importance is rising, he says, in response to Dias.

He notes in the past the limited amount of information allowed in tailor-made decision making. "The Delphic Oracle" appeared to be able to give correct answers on no information input. However, recent discoveries suggest that seven days of informal meetings between the king's entourage and the temple servants took place allowing informal information channels to be established. The Oracle was thus fully informed before the Kings were allowed to present their answers. This is a good example of "organized information."

If citizen participation is the desirable way, then there are weak points because citizens are untrained, and planners have no informatics skills. This does not guarantee more efficient strategic policy formulation. Precise bottlenecks must be located in order to understand the limitations of the training experiments.

"Orgware" is important but, as Dias said, hardware is equally important. Regarding the definition of information, it is structured data, focusing on policy decisions. Resistance against information systems sometimes requires reorganization of the agency, and new skills. It is sometimes impossible to tailor-make an information system for an existing organization.

Bureaucratic organizations will never be able to make full use of advanced information systems.

Concerning strategic information design for long-term planning and the differences between developed and developing countries, the speaker is not convinced that there are really such basic differences. Questions and issues may differ but institutional and organizational problems are the same. (He cites the examples of India and other developing countries where the same problems are faced in the case studies.)

The speaker admits that he has not been able to address the whole range of questions raised, but under severe time constraint he concludes his response, inviting further discussion in an informal setting, later.

GENERAL DISCUSSION

Monday, 16 June 1986, 16:30-17:30 hours
Chairperson: Marvin L. Manheim
Rapporteur: J. S. Edralin

The major question raised was, Which level of personnel should training be aimed at? From the standpoint of UNCRD, the Director made it clear that the Centre is partial to the training of trainers and senior- and middle-level personnel throughout the governmental hierarchy (or the national, regional, and local planning offices). The participants supported the concern for training this target group, as this group is believed to be more open to change and thus is trainable. One difficulty that was mentioned, however, is the need to ease skill shortages, slow down the transfer of senior personnel in short supply, and assure project continuity in developing countries.

From the accompanying table 1, it can be seen that the target group for training in the uses and applications of information systems in regional planning includes policymakers, middle management (i.e., the policy staff involved in design, analysis, and implementation; the planners; and the development analysts), the information staff (i.e., the information systems designers and the data collectors), and the mobile agents who can be moved from location to location for training and staffing information systems projects. The knowledge, skills, and attitudes required by this target group must be developed through both formal and informal instruction. Training schemes may consist of in-house and external training projects, developing training materials, conducting training courses and workshops, undertaking pilot demonstration projects that extend over long periods of time, and establishing training networks, national contact points for networking, and networks of alumni and professional associations, newsletters, and other communication channels. Trainers may also come up with other projects to support their training (i.e., identifying appropriate information technology, reward and recognition programme, job and educational placement, training trainers, documenting and disseminating information, and institution building).

TABLE 1. PROPOSED TRAINING STRATEGY

Target Market Segments		Type of Knowledge	Educational Projects	Evaluation of Projects
		Attitudes/general	Who; What	National
		Awareness/general	- Developing training materials - case studies	Local
Policymakers		Capabilities/specific		UNCRD
Policy-staff-design, analysis, implementation (middle management)	Public	Skills	- Doing training - courses, workshops	
	National		- Pilot project	
	Regional		In-house training projects	
	Local			
	Private		External training projects	
- Planners			- Simple network	
- Dev. Analysts			- Extended training network	
Info Staff - info personnel - IS designer - Data collection			People-focused or org.-focused	
			- "alumni" links	
			- prof. assn	
			- consultative support	
(Mobile agents)			- review/training	
			- networks	
			- newsletters	
			- periodic regional meetings	
			- training media	
			- software updates	
			- Identifying "appropriate tech" IS	
			- Reward & recognition programme	
			- Documenting/disseminating	
			- Placement - job - education	
			- Training trainers	
			- Building national insts.	

SESSION 4

Tuesday, 17 June 1986, 09:30-10:40 hours
Topic: The Third Computer Revolution: Implications for Training in Developing Countries
Speaker: Marvin Manheim
Discussants: Toshiyasu Noda
Hideaki Hoshina
Chairperson: Chakrit N. Padungkarn
Rapporteur: Aminta Lara-Peters

Discussions on Manheim's presentation: The third era of computer supported information systems (IS) applications, in particular the application of microcomputer systems, was the focus of the discussions that ensued after Manheim presented his paper. The question of training the users of these computer systems (CS) was considered. It was felt that any design of IS and training course for the IS staff and users, must first of all consider the choice of the target field of planning to be aimed at, in particular the space level defined within regional planning. With regard to the space level to be chosen, it was pointed out that plans are classified into national, regional, or community level ones; in addition, there are various kinds of plans, e.g., national comprehensive development plans, economic plans, or land use ones. Because IS and training vary considerably, depending on their level and purpose, it is preferable to take a limited target according to the space level and to the purpose of the plan. It is particularly important to think about and take into account the relationship between the structure of the hardware and the space level to which it is applied.

One would have to agree with Manheim, that comprehensive development plans and large-scale economic model top-down systems with large CS and data bases are needed. However, this can be rather costly; thus the question was asked whether such large IS are needed in ordinary planning, particularly in developing countries. There was also general agreement with Manheim's recommendation for developing user-dominated compact computer systems through the use of microcomputers in regional planning in developing countries, as various kinds of analyses and modelling for regional planning are possible with the microcomputer. However, it was pointed out that the important factor to consider is which process of regional planning is suitable for computer processing.

The idea that computers can currently contribute to the decision making process was questioned from the standpoint of artificial intelligence (AI); a word of warning was sounded on the limitations of AI systems and how to use them more effectively in the planning process. Oftentimes large-scale economic models and even conventional studies produce very confused and complicated results which finally disturb the decision making and planning process. The opinion was expressed that although the computer is good for doing routine work, it can effectively be used as well in planning in developing countries.

With regards to training priorities, it was pointed out that IS staff can learn and master the software packages and their application without much difficulty as nowadays it is possible for people to teach themselves with help functions provided in the software. However, software packages provide no instruction on how to make a database from an economic perspective; therefore, it is important to give high priority to ways of developing a database for the training course on regional planning.

The arguments among architects were brought to mind on how to introduce CS in architectural design, which the central question at the time was whether CS were capable of creative activities in themselves, or whether humans must contribute to creative activities with the assistance of routine processing of data and information by mechanical or electronic means such as the computer. CS and analytical programmes can be used in architectural design and in some stages of the planning process, particularly in structural design and graphic presentation with the use of computer graphics software. The same kind of arguments emerged as well when developing the gaming simulation for UNCRD's general training course in regional development planning, it was said; two major problems were confronted when applying systems dynamics models to the situation of developing countries: (a) difficulty in getting reliable census data in developing countries, not because of lack of data, but as Manheim pointed out is the case when top-down information is used, the data contain errors and only reflect certain aspects of the real situation; and (b) as again pointed out by Manheim, the information coming from bottom-up activities tends to be more qualitative than quantitative, and therefore left up to interpretation. Concern was expressed for the need to resolve these two problems of data collection in order to develop more systematic and dynamic models which can be more useful for training purposes.

There was also some question on the three eras of IS applications mentioned in Manheim's paper, as to how these relate to the developing countries. It was pointed out that the developed countries have experienced all three stages of computer supported IS applications, thus there has been a gradual, continuous development and change in CS. But the accessibility of the personal computer (PC) has brought about a leaping in the developing countries from the first to the third era, without the same continuity. The question was asked whether this discontinuity will not result in misuses and misapplications, as well as in misunderstandings about the limitations in CS applications, such as the idea that CS can do everything that humans can, as already discussed in reference to AI systems.

It was said that Manheim's presentation was reminiscent of arguments for privatization in England: If institutions in government are in part information generators and providers, what can be done is to privatize them and make them part of the private sector so that they can compete with other information providers. Mention was made of how the EEC, through its Director General, has been developing some interesting theoretical arguments around this idea in relation to its work on information models. So if one of the functions of training agencies is training, that too can be privatized to allow training institutions to compete as well. Two questions were raised with regards to this: (a) What is the function of a planning agency, or in more general terms, what is the function of the State? Historically, it was argued, the State needs to exist precisely to be able to sort out the contending parties within the development of private capital. If the logical argument is followed on the privatization of those departments of government, then who is to act as the regulatory organization? We are faced with the question of what is to be the nature of the regulatory organization for transnational or multinational capital. (b) The second point relates to the question of developing countries, because the whole argument of developing economies is that it is precisely the inadequacy of the capital based structure which allows for the emergence of competing private capital that requires the function of the State within State capitalism in developing countries to allow for that point of accumulation so that the private sector can emerge. And the requirement of the State in developing countries is precisely to act as that agent and capital generator, which means that you cannot talk about privatization until an economy reaches a stage of development that actually has already taken off.

It was stated that there seems to be a gap between the academic field and the computer science field, and that what Manheim presented relates mainly to the computer science field. As already mentioned, developing countries do not share the same experience in the evolution of information technologies (IT). There are too many instances to verify this, as when computers have been installed in planning offices in developing countries merely because the planning board required it, and not because there have been qualified persons assigned to operate them at an advantage to the planning process. Also, as all the software is standardized, it oftentimes cannot be used in specific work required by the planning side; at the most, it can be used for tabulations or to process simple data. Some kind of survey or study was suggested on what the needs of the users are, as a way of attempting to learn how to meet their demands. A cautionary remark was made that if such an attempt is not made, there will be two parallel efforts, an academic one and one on the planning side which demands that people own a computer.

This was followed up by the point that these issues are related to questions on the absorptive capacity of developing countries for any kind of technology, and not just necessarily IT. It was mentioned that there are many cases of past failures in trying to introduce new industries and technologies, but in most cases it was observed that there is a big gap between the absorptive capacity of these countries for those technologies and acceptance of the development technology itself. But as it has already been pointed out, the developing countries are clearly expected to take a leap forward in this direction, without knowing whether the effects from this will necessarily be uniform in all cases.

Manheim's reply: Manheim maintained that he had not argued for privatization or for shift in the planning function away from the State. What he did argue was that in most cases the IT function in a planning agency may be among the most advanced IT functions in the country or region, and therefore has a responsibility and an opportunity to be a direct catalyst for change. He asked for more careful questioning of one's beliefs about what the planning process should be like, because his position comes from a belief based upon three years' experience in planning in a wide range of countries, that a large amount of planning activities is irrelevant to the actual process of development. Manheim therefore rephrased the question as one of not should developing countries leap from the path of development, but one of whether the opportunity created by the third generation of IT allow planning agencies to become relevant to development in ways that they have not been relevant hitherto. He stated how he understands deeply the problems and limitations of capacity transfer. But based on the many exciting examples he has been able to observe of the power of the microcomputer and appropriate software to catalyze people to do things which they would not have anticipated they could do, he strongly feels that it is possible to capture that power. He cautioned that the danger lies in taking present planning rhetoric and planning methods, and simply putting them in a smaller machine and trying to teach people how to do gravity models, scaling, various forms of economic models, or whatever calculations, and simply use the CT as an attempt to further reinforce the conventional wisdom of technocratic planning. Although he feels that this would be a mistake, Manheim nevertheless admitted the usefulness of supporting planning activities of that kind with some CT. However, he reiterated that the real power of the third generation of CT lies in catalyzing development by individuals and small groups and organizations, and in catalyzing the creation of growth points.

The example of training professionals in using IT in planning agencies and not being able to keep them because they can get higher paying jobs in the private sector was cited. But from Manheim's perspective this should not be considered a disaster, because instead a cadre of entrepreneurs and catalysts is being created who are really going to be stimulators of socioeconomic development in their countries and who will bring about capital accumulation in ways that central governments can only hope to promote indirectly. According to Manheim, therefore, the role of IT in planning agencies is to help planning agencies become real engines of development through transferring high technology out into relevant applications. For example, he elaborated on the long-term merits of working with the spread sheet alone. Manheim compared the nature of the relationship of the individual to the spread sheet with the relationship of the architect to the drawing board, and pointed out that the spread sheet becomes an environment for "sketching," in that it allows one to look for data to fit into it, make models, vary the factors to be analysed, i.e., evolve, refine, and play with the analysis until one arrives at an analysis that fits a decision. In other words, rather than being a model of the technocrats' ideals, the spread sheet is a tool that supports a decision; it encourages relevance to decision making, encourages wrestling with limited data and making judgements to fill in the gaps, encourages creativity in trying to think about what really are the central issues that need to be understood, and encourages communication of the results. The spread sheet model is easy to understand because it is very visible; and because people can visualize it, they can comment on the assumptions and on the data, point out where additional data might be available, argue about the model, and make changes on it accordingly. It is a tool that can be understood and which can have significant impact on a set of decisions. Manheim reiterated that the power of the microcomputer lies in the fact that the user can control it, can shape the analysis, and thus it represents a great opportunity for us.

Among the disadvantages or "dangers" of the spread sheet cited by Manheim are that it is limited to quantitative data. Thus, there is a tendency to promote number juggling, numerical data bases, and numerical analyses, when what is needed is more creativity and ability to deal with qualitative data; but on balance, Manheim maintains that those limitations are far outweighed by its positive attributes. He also cited "dangers" in the tremendous rush towards AI, the greatest pitfall about expert systems in particular, as well as AI techniques, is that everything is being built into the computer rather than leaving the logic exposed for judgement and for the user to change accordingly. He stressed the role of judgement and how important it is to train people to think about what they are doing, to be able to work with limited data, limited assumptions, and to be very enterprising and open about it. The fact that data do not fit a model indicates that the model is expected to play too strong a role. If the role of computer supported IS is to help individual planners and decision makers gain insights, then detailed data are not required at the same level; in fact, all data sources need not be consistent nor all models need to be statistically estimable. Simply, a style of analysis is required for which the microcomputer is a very important tool.

SESSION 5

Tuesday, 17 June 1986, 10:50-12:00 hours
Topic: Fundamental Issues to Include in Training for Information Technologies
Speaker: Linda K. Carlisle
Discussants: A. S. Bokhari
G. Shabbir Cheema
Chairperson: Chakrit N. Padungkarn
Rapporteur: Aminta Lara-Peters

Discussions on Carlisle's presentation: A. S. Bokhari complemented Carlisle for her excellent overview of the problems that are likely to emerge with the introduction of IT, particularly in the developing countries, and for highlighting and elaborating the issues involved. The major thesis developed in Carlisle's paper is that decision makers must acquire an in-depth knowledge of the relationships between IT and the centralization process, the cultural diversities operating in developing countries and the organized structures in planning, and so forth. She warns that it is necessary for top policymakers and decision makers to acquire some knowledge of these relationships prior to introducing these technologies, otherwise the goals of efficiency, increased productivity, and so on, cannot be accomplished, and instead of solving the management problems of IS, many problem areas will emerge. But the discussant differed in this assessment of the fundamental issue and instead pointed to the issue as being how to best adopt appropriate technology, whether automated or semi-automated, in the overall framework of manpower development in developing countries. It was argued that in the context of regional planning, whether for rural or urban development, highly sophisticated technology is just out of place in the developing countries where literacy rates are so low, and therefore will not be cost-effective. Therefore, how to dovetail this process of introduction of such technologies with the overall development plans of those countries is an issue that needs to be carefully considered if efficiency and productivity goals are to be achieved. However, it was emphasized that the goals of efficiency and productivity are difficult to achieve in those societies. Apprehensions were expressed that when introduced indiscriminately, those technologies could impair employment patterns and destabilize the entire economic and political structures of those countries. It was observed that despite the enthusiasm on the part of some developing countries to introduce IT, the results have not been as successful as expected, and in many cases have even been counterproductive. Bokhari's position was that those technologies should be introduced gradually and in a manner acceptable by the society; that is, some logical sequence should be followed whereby all the echelons of the organization, from the highest policymakers to the lowest clerk, should receive intensive training on what role they are expected to take; everyone's role should then be carefully integrated within the whole system. It was felt that many agencies would be willing to participate in this endeavour. Prior to introducing these technologies, it was said that it should be clearly decided as to which ones to introduce and at what stage, and also it should be thought as to how these are going to be evaluated.

References made to experiences of the Asian Productivity Organization and the Institute of Public Administration, New York City, were thought to be irrelevant and opposite to the experience of Pakistan's ineffective results in introducing IT in the rural/agricultural sector. Concern was also expressed over the threat that IT poses to labour in terms of loss of jobs; IT allows room for only a few individuals to become highly specialized and skilled, threatening the employment situation of the lower and middle staff levels. The need was voiced to clarify and elaborate what is projected to happen with regards to this threat, especially in areas and cases where the unemployment problem is very acute.

Examples of training courses conducted in developing countries were presented, and problem areas discussed were criticized as the result of "slip-shod" training methods employed; it was pointed out that such methods could not possibly be effective in introducing the new technologies in developing countries, and that they should be abandoned for more effective and relevant ones. In Pakistan, it was said, the consensus is that the country needs to have its own institute of statistical training and research, and perhaps it would be more effective if such institute approached the vendors of this sophisticated technology to bear some of the capital cost for the country to acquire such technology, as after all, it will be their products that will be on sale in that country. Currently, it was mentioned, Pakistan is trying to negotiate how to set up such a training institute through those vendors. Negotiations with IBM have not been very successful, but it was felt that UNCRD could perhaps provide another way to tie up developing countries with some of those vendors in the market.

Finally, doubts were cast over arguments for a "mix" of training programmes, as it was felt that the curriculum must be very comprehensive to meet the needs of developing countries. Unless the initial training is very thorough, it was pointed out that it would take a long time to capacitate people to a level at par with those in developed countries. Sending a few persons abroad for training, having a consortium for a specified period of time, offering a package programme for short durations to a given country, having workshops, seminars, etc., was said to be ineffective. The need for developing countries to have their own institutes for internal training was emphasized, and hopes that the vendors of high technology will help support the establishment of national institutes for those purposes were reiterated.

G. Shabbir Cheema voiced disagreement over the idea of regarding IS as a catalyst for social and economic change; instead, he said IS is a means to an end. As a better decision making tool for national, regional, and local planning, management and implementation, IT and IS are a step below the actual decision making structure within the administrative and political system of a country. He pointed out that it is necessary to recognize the obstacles in developing countries for policymakers to use these technologies. Oftentimes, when evaluation studies of some projects are done where millions of dollars have been spent, he observed that there is an abundance of data, but that such data are not necessarily comparable. Those evaluation studies are very weak empirically, so that such data can be interpreted in any way desired. Thus, the format for data collection is more critical than the kind of technology used. An example of Pakistan's ineffective results with the use of IT mentioned earlier was cited by Cheema, who related a personal experience whereby he was asked to do a study of local resource mobilization through the community councils. Cheema felt that the computer he had access to was of no help, as the data from the four provinces under analysis had used different formats to collect data which were first sent to the district, province, and then to the central government; by the time it reached the central government, there is very little comparability.

Cheema expressed interest in the idea that IT affect hierarchical structures in all societies and countries. But beyond some judgements based on some experiences, he pointed out that there is not yet sufficient empirical evidence available on the impact of IT on hierarchical structures, the extent to which IT will lead to open decision making and to displacement of positions, and how this will facilitate bottom-up planning. These concerns led Cheema to conclude with the following questions addressed to Carlisle: Is there any information available from your work experiences in Bangladesh and Indonesia about improvements in decision making as a result of the introduction of IT at the regional and local levels? Is there evidence from the U.S. experience on the magnitude which IT has replaced or made redundant many positions, as discussed in your presentation? Since more specific answers are needed at this stage, and since you have experience both in the U.S. and in developing countries, could you elaborate to what extent the introduction of IT is likely to affect the employment pattern? And, finally, with regards to your comments on training, who should be trained?

It was questioned whether the computerization process would be a slow implemental process at all, adding that once IT became adopted in a few places, especially at the local level, if it proves to be successful in regional planning, there is likely to be an explosion whereby every district is going to want to have a microcomputer and there are going to be people who can operate it; thus, if this is successful, it will also be a problem.

It was stated that there are detailed empirical studies not only on the relationship between technical change and employment, but on the contribution of microcomputers and telecommunications to the change of spatial distribution in industrial development; these spatial location industries are increasingly important for planners, it was said, particularly the question of financial services industries upon the whole spectrum of financial services and industry. Deregulation of stock exchanges leads to new technology which in turn will have interesting implications, it was added, referring to studies done on the impact of spatial location and changes in employment distribution.

Following these comments, the point was made that IT can be seen as an external factor causing changes which managers have to adjust to, or as a source for managers to bring about desirable changes. It was added that this has a number of applications, and an example from the U.K. was given to illustrate this. The U.K. is currently looking into ways that IT can be used to change the structure of the international art market. It turns out that there are US$400 billion in art assets in private hands worldwide, which is the last source of capital that is not leveraged; that is, someone who owns fine arts cannot borrow money against it or take credit, except through various laborious procedures. So ways are being explored to establish a computer-based registry of fine arts, supported by the insurance industry in the U.K. to change the way which access to finance by owners of fine arts is used. This was pointed out as a whole new set of strategic opportunities which opens the potential of a whole new way of dealing in this case, with financial resources. Managers, it was argued, could follow suit and see IT not as a threat, but as an opportunity for deep thinking about ways of changing the constraints they face. In terms of the examples given in Carlisle's paper, it was observed that one of the problems is to view the role of training as capacitating the individual for a specialized task and a limited job, rather than training the individual to be a catalyst of change no matter where he or she may end up working. With this, the question re-emerged with regards to who should be trained in the new IT?

Carlisle's Reply: Carlisle initiated her reply to the many issues raised by saying that the kind of training that people receive in large part depends on who they are, what their function is, as people have different roles. She rejected the notion that end-users do not need to know about the new technology, because she argued that in their capacities and in their jobs they have to come into contact with it in many ways; they will be clients, manufacturers of new technology, it all depends, as it is all so interrelated. For example, if an automated personnel system is developed, the end user may be a manager at the regional level in one of the areas, and if the technology has advanced to the point where a manager has access to a terminal from where he can read information off, he needs to be trained. This is certainly clear in the case of sophisticated budget systems where the budget analysts who are using the central government's information may have terminals in their own desks, and may thus have not only a read-out function, but must be able to deal with it. She reiterated Manheim's comments on the lack of training and lack of thought about how IT should be used overall, which in no way ties to the reality of sending someone out of a country for two years and paying a lot of money for his training. New technology offers us an opportunity to direct our futures, she said, to anticipate what is going to happen, or to sit back and let it guide us; and she advocated training people so that they understand how to guide the technology. She expressed agreement with the criticisms made on her paper, and concurred with the comment that it is a slow implemental process which may actually evolve into an explosion, as it has a snowball effect.

In terms of effective manpower planning, she added, we need to work together with aid organizations and officials to help them be more realistic about their enthusiasm for advanced new technologies, as well as help governments realize that hardware and people cannot just be thrown at a problem, but that more critical thought must go into it. A clarification was made on the notion that the new technology meant a loss of jobs; instead, Carlisle said, it will mean a shift in the types of jobs to be accomplished. The example was given of the decline in the manufacturing industries because of automation and the use of robots; but she pointed out how this was counterbalanced with an increase of jobs in the service sector, arguing that there are significant opportunities in this shift for developing countries to take advantage of now. The example of financial institutions like Citibank in New York City sending its keypunch work to be done in the Republic of Korea, Taiwan, and other places, earlier discussed, was brought up as a case in point.

In answer to the question on her work experience in Bangladesh and Indonesia, she stated that those programmes are geared toward enhancing management capabilities, and are not specifically addressed to IT, although some people in the programme are currently working with those issues. She said that the programmes are new enough and as of yet there is no evidence of their success or failure, as these things have a very long time line. She added that introduction of new technology is not something that you can do a cost-benefit analysis of in the first year or even the first five years, but rather, that it is a very long-term, evolutionary process. On the question of the U.S. experience and the magnitude which IT has replaced or made redundant people's jobs, Carlisle pointed to a number of studies that would have good information on this, and regretted not having any specific figures on hand. She was only able to cite general trends in terms of losses in manufacturing and gains in the service sector, and reiterated her argument that it is not really an issue of people losing jobs so much as one of jobs as well as opportunities actually changing.

SESSION 6

Tuesday, 17 June 1986, 14:00-15:10 hours
Topic: An Integrated Approach to Training for the Establishment and Use of Information Systems for Subnational Development Planning
Speaker: K. V. Sundaram
Discussants: Heera Raj Regmi
R. A. van de Putte
Chairperson: Chakrit N. Padungkarn
Rapporteur: Aminta Lara-Peters

Discussions on Sundaram's presentation: This paper was said to be written from the perspective of the role of IS in development planning, and of decision making in general. Its general message is said to be one of how can training be functional so as to ease the introduction of IS into planning systems; this points to the need for differentiation in the training of those who are concerned with IS. This was seen as a positive point, as information does not play the same role for everyone involved in decision making.

The idea that it is hopeless to convert senior-level people into learning to use IS was felt to be too pessimistic; thus, instead of drawing a distinction between the various conventional levels, the discussant drew a distinction between what he called the "decision makers" and the "decision takers," and defined decision makers as ideally those who prepare the material for decision takers to act upon. He also defined good situations as those where there is a lot of interaction, and bad situations as those where the decision taker is the one who just signs on the dotted line. In fact, he added, the users of information are the decision makers, the ones who work out different scenarios and different possible alternatives. They are actually the users of information, whereas the decision takers are not users of information but the appraisers of information. If these people can be trained to be aware of and critical about the quality of information to be used by decision makers in the preparation of their alternatives, the discussant opined that they can play a very dynamic role and spread some motivation to others to use better information, and therefore to use IS. In other words, a demand pressure will emerge for the use of IS which will greatly help other people to use it. If properly approached, he said, decision takers can play a very positive role in promoting appropriate IT and the use of IS for better decision making.

He added that the other aspects of those involved in information and therefore with IS are the people themselves, as Sundaram had also mentioned in his paper. Decision making is not only the result of formal procedures within government structures, he said, but the result of influences of a great number of pressure groups. An example from Indonesia was given whereby a prominent Indonesian official had pointed out that if one wants to know where decisions are taken and what is the role of information with regards to those decisions, one should sit in an organization, but not just look at the formal structures because in fact they are not the most important; it is necessary to identify the centres of power within an organization or even outside because that is where the important decisions are taken. Thus, it was emphasized that if one is talking about information to support and improve decision making, these centres of power should not be left out.

Concern was expressed over the idea of an integrated course involving management and IS professionals; despite its interesting possibilities, it was felt to be very difficult to accomplish. An additional comment was made that an integrated approach to the establishment of IS is difficult from the point of view of an integrated IS itself. With the decentralization of planning activities to the district level, all government organizations have been organized under separate line departments so that each organization has developed its own model for conceptualizing and collecting the information itself. The result is a hodge-podge of information coming out of the district level, it was said, and how to integrate the information from the various sources is a crucial problem for which separate training might be required. The fact was reiterated that authority structures do not match information structures, and that the big problem facing developing countries is that information structures must evolve first.

Sundaram's reply: Sundaram agreed that it is very difficult to run an integrated programme as he advocates, and recounted an experience in India with developing some rural IS for district planning, that is, local-level planning. Due to the heavy emphasis given to decentralized planning in India, he said, there is now a so-called planning cell within every district. With the broadening of the government line functionaries, district planning personnel, and horizontal groups functioning at the district level, these designers sit at those levels so that they have access to the microcomputers and other IT, and he observed that the results have been remarkable. Although it is too early to evaluate the effectiveness of this from just this one experience, he added that this represents a challenge for developing countries.

Since a great deal of emphasis has been given to decentralized planning, Sundaram said that decentralization is increasingly becoming a reality in all developing countries, giving rise to new authority structures. If these authority structures are to function and really deliver the planning at that level, it was felt that compatible information structures are needed at the same level. But it was lamented that unfortunately an important problem today is the mismatch of the authority and the information structures. It was pointed out that a disparity exists between these structures and that they function in a vacuum because relevant information structures have not been built. One way to bridge these structures, it was said, is to build information structures and to introduce training in a big way. This was felt to be a very critical component of development in developing countries.

SESSION 7

Tuesday, 17 June 1986, 15:20-16:30 hours
Topic: Varying Information Needs for Local and Regional Planning and Their Implications for Training
Speaker: Hiran Dias
Discussants: Marvin Manheim
Ian Masser
Chairperson: Teitaro Kitamura
Rapporteur: James A. Jolly

Hiran Dias, commenting briefly on the parallels in prior presentations, sought to focus thinking toward the specific tasks of those people who will eventually receive the training. He began by suggesting a separation of the types of people involved at the local or regional levels into two categories: the "doers" and "thinkers."

At the lowest levels we are dealing mainly with the "doers." They collect, verify, and help process data up to a certain point and then they have to communicate the collected data or information up to higher levels. In this regard, they must be made to understand what they are to communicate, and training must be geared to give them skills for their particular tasks or functions.

At the higher level (subdistrict, district, or regional), the personnel involved in information are sometimes "doers" and sometimes "thinkers." They receive and process data from below, decide what to do with that information (even if only to enter into computers), and maybe generate their own data at a lateral-agency level, and then provide the information for the end users. It may be used by people who are really concerned with carrying out the tasks, either at the same level for planning, implementing, or choosing options, or by those of higher levels for policy decisions.

Another aspect of the doer-thinkers of this level deals with their planning functions as planners or administrators. They have to decide about policy -- not necessarily making it -- rather what is to be applied within the framework supplied from higher up as it applies within their jurisdiction. They translate policy from above into information programmes and projects. They use information to organize and implement projects and programmes, to monitor and evaluate these, and to redesign and modify plans.

Their reliance on information is great at this level, so they should be the ones to determine what information needs are. They should think about what particular information is needed and specify the requirements for getting such data. They also decide how reliable the data needs to be, since it is not necessarily required to be 100 per cent accurate. Here they can design the instruments of data collection, decide the way in which data is to be processed and analysed, and how the resulting information is to be presented. In this they need to be able to conceive alternate scenarios and be able to evaluate different opinions.

Training at the highest levels may vary depending upon the kind and degree of decentralization taking place and terms of the approach to planning. Decentralization is decisive as to the extent particular activities or authority are decentralized and whether the capacity to use such decentralized authority is there or not. There is a need to know the capabilities of each level.

Using an example problem of malnutrition, he then illustrated two separate sets of implications depending upon the use of the top-down or bottom-up approaches adopted. There is a difference in the kind of information that one requires depending upon the approach. The point stressed was that the duty to train people to collect and process data is different under different circumstances. Therefore, we have to think of the specific needs of a programme and the circumstances at that particular level of activity when considering training of the personnel involved.

With the amount of data becoming more weighted and larger and the ways in which we use data becoming more complicated, it is fortunate that the new technology enables us to handle it in more varied and flexible ways. We can answer many more questions. However, there is still one complaint -- the present software does not necessarily answer the questions that planners want to ask. It is important to bridge the gap between the software developed up to now to handle data and the kinds of information planners require to make planning decisions.

We need to develop a class of people who are going to bridge the computer technological aspects and the planning needs aspects to come up with appropriate programmes. In doing so, these need to be simplified and made user-friendly, so that local-level personnel can operate them. This is the challenge for UNCRD and other agencies, with emphasis on promotion and coordination so that these can be more purposefully developed.

Moreover, considerations should not be confined to information collection and handling aspects only, for there are specific problems of information technology in an environment where the infrastructure for computer technology is underdeveloped or very poorly developed. This presents a whole range of problems related to repair and maintenance, since mechanical failures can lock information into the computer so that no work can be done at all. This is related to making a system that can still function under situations of power failures and fluctuations. How do people cope with these problems, and can we prepare the user to handle such situations?

He concluded his presentation with references to Appendices I and II of his paper in regard to two specific programmes being carried out at AIT concerned with these issues. He commented that AIT has capacity in its programmes that it has not used yet, and perhaps this and that of other agencies could be integrated with UNCRD programmes in the region for more effective problem solving.

Marvin Manheim began his comments with the observation that he had made a rough estimation of how large the market is that we are trying to serve. He estimated about sixty countries, times thirty political divisions each, times about fifty lowest level organizations, which would give a total of about 90,000 agencies. He suspected the figure might be closer to one-half million. It is a very large market, and it might be worthwhile to calculate the figure more precisely so that we could have a better understanding of what the target is.

He expressed that he was particularly impressed with the arguments that there is a very varied set of needs for not only data, but analysis tools. Emphasis is laid on analysis tools, because there is a tendency to be preoccupied with data and mapping whereas it should be clear that the key issue is to influence decisions using sparse amounts of data and judicious amounts of analysis. This suggests a style that he terms "responsive analysis."

In defining this term, he used an example of conventional planning analysis. Conventional planning analysis teaches planners how to do things "the right way." There is "a set" of models and techniques and "a set way" of analysing data, and each school, academic programme, teacher, or administrator has his or her own preferred way, and that is the "right way" to do planning. It is very clear that there is no right way to do planning — that the approach to use in any particular situation involves sizing up the issues, data availability, the available tools, the staff resources, and reasoning through to a decision on how to produce an analysis that is relevant to the issues.

Appendix I of Dias' paper was cited as particularly fascinating because the structure of the policy-oriented questions there lead the reader through a process of successive approximations to home in on what is the most important data to apply in a given situation. This suggests a fundamental training objective to educate planners to do an analysis which is responsive to the needs of a particular situation rather than applying a "canned" or prepackaged set of tools. Also from the point of view of information systems, the need is very strong to develop a rich variety of alternative tools and approaches, rather than trying to put a lot of effort into a few major tools, because it is very clear that in our large market there are going to be many different situations that will require different approaches. Therefore, we need to see the development of families of alternative tools.

This led to another set of problems: every agency, every planner, every educational institution developing its own particular models with different user interfaces, different keyboard conventions, or different screen layouts. As a friend said, the problem is not developing particular microcomputer programmes; the problem is when you work on a particular problem you need to use several programmes together, and it costs you more time and effort to link the programmes together than it did to develop the programmes in the first place.

So there is a major technical issue which is to try to develop some kind of loose standards to guide people's development of software so that there are some possibilities of pooling the tools that are developed in a variety of institutions and organizations and so that there can be some linkages among the tools. It is a major and very technical issue, and we have done some work in this area. Although usually opposed to efforts to establish such standards, he suggested it may be particularly important to do some kind of loose standard development in this case.

Finally, one of the biggest issues is that packaging a planning method as a software tool makes it even more difficult to critically evaluate that tool. There are enough questions about planning methods in general. A great many are simply techniques for juggling data and producing what are claimed to be profound insights. As it is, there is not enough questioning of planning methods, either by planners or by their customers. So he is quite worried about the packaging of planning methods in computer programmes which add even more power and sense of authority.

So there is another role to be considered, which is the critical review and appraisal of planning methods packaged as software tools, and critical review and appraisal of planning exercises using information systems tools. Culturally, different professions have very different styles of criticism. Among economists it is absolutely impolite to not criticize someone's work. In economics it is a highly held cultural value that one must have open and critical debate. Unfortunately in engineering and in planning, the emphasis is at the other extreme. Very rarely do planners criticize one another's work in the way they should. So there is a real need to develop an environment of open, professional criticism of planning methods and especially information systems and applications, because fundamentally the issue is (as Dias indicates) to have planning analyses which are relevant and useful to decision makers.

Ian Masser opened his comments with expression of concern about the sort of expectations we seem to have about both planning and information as expressed in the paper and from some other contributions that have come forth. The point made at the start of the presentation that we need to put information into perspective is a very, very important one. Does information make development more effective? The answer depends on what style of planning you are working with. Our thinking may be in nice rational planning model in which information gives you insights, which allow you to make better decisions. However, experience of planning in practice is that such is only an occasional feature of planning. Planning is often very stubborn, very riddled with inertia; it has got all sorts of preconceptions.

Citing an example not from a developing country to show the sort of muddle that developed countries can make, he related an experience from Britain. A local structure plan was implemented in his area, and when it was necessary to develop a monitoring system in the true, approved manner, the political bosses of the area said, "We don't need to monitor the introduction of the cheap fares policy" (which gave virtually free transportation to everyone in the area). "We know it's right. We know it's going to deliver the goods for our people." And they scrapped the monitoring arrangements overnight. This may be said to be bad, but it is not as politically stupid as it sounds in planning terms.

In another aspect, he pointed out, there is a sort of peer group evaluation if one is going to achieve status as a planning authority. You often go through certain exercises, and what happens in those exercises is almost trivial. What you are doing is achieving a sort of status or legitimacy by going through certain processes. The actual results are relatively unimportant. In a case in Holland, it was amazing when it came to following up the actual usage that had been made by the users of information in terms of the relatively low level of utilization. It was only justification usage for preconceived ideas. Very few people seemed to change their ideas as a result of information. In an American example, an information scientist proposed that the problem is to supply information to an organization that does not know what it wants and would not know what to do with it if it got it.

The real point to the whole issue is that we should not underestimate the extent to which we are dealing with a learning process. The whole question about introduction of information technology and systems into organizations is to very much recognize it as a learning process, not just for the users but also for the designers. This also extends to developing training programmes. We should be trying to learn from the experience so that for the people coming to our courses it is not just a question of supplying experiences.

He then raised as a question to be pondered the issue of qualitative information. What are we doing about soft information or intelligence? How are we handling that? Up to now almost everything related to quantitative information and applied only to numbers, yet a great deal of information that we are handling is not naturally in numerical form.

Finally in a question directed to Dias and the experience at AIT, he posed to what extent we can build in self-learning components into these packages. Can we send them out and have people work with them and learn from them? He noted that the programmed floppy disk that contains the teach-yourself-programme is often the most valuable component of training here. At the moment there tends to be enthusiasm to start the package off, but the learning possibilities are not there yet. These may be examples of the sort of documentation and way that we ought to be going about it.

John Lindsay observed that he found the processes of physical planners, architects, and engineers fascinating. He cited his experience in growing up in a run-down part of London when building tower blocks was the passion of the age. The intention of the planners and architects, of local government, and of the plan was to demolish all the buildings in order to build tower blocks. He was among those occupying the houses to stop the police and the bulldozers from demolishing the houses, and they were successful in the battles that went on for a few weeks.

Then slowly somehow or another, rehabilitating old houses became fashionable, and the architects developed their expensive designs for rehabilitating old houses. The very political leaders that had sent in the bulldozers before, now were saying that tower blocks were absolutely disastrous and questioned how architects and planners could have thought of them in the first place. Nowhere in the literature can we find any sort of political analysis of how this transformation took place in a very short period of about ten years.

In discussions about information systems, consideration should be given to this perspective to be able to develop a historic trajectory so that we do learn out of the previous experiences. We have to make ourselves accountable for our own mistakes in the past. We have to be able to develop a mechanism to recognize the way in which it was that we had historically made mistakes, so that we can learn from them.

In response, Hiran Dias expressed his concurrence with the need to grapple with the whole question of the perspectives in which we should look at information. Drawing upon his Sri Lankan experiences, he noted that often the mistake was made not due to lack of information, but due to the failure to use the information that was available. We have assumed that information is required for planning and that everybody is waiting for this information; we need only find ways in which to produce it more quickly and better than before. However, the problem seems to arise as to whether people really do want this information. Also, even if the information is made available, would the plan in itself improve as a result? A lot of decisions are made not necessarily on the basis of the information supplied.

Also he observed that in the context of local and regional planning, no real planning goes on. It is largely a selection of projects, and what we probably need information for is to be able to select these projects a little better than we do now. He characterized this approach, which he uses at AIT, as "how to make a better shopping list, not to make a better plan." Also rarely does one formal plan cover all the investment of a particular area. There are often many different agencies and programmes which are independent of each other and doing their own particular bit of planning.

He expressed agreement with Manheim that packaging selected planning methods into a computer package is dangerous, but very effective. Politicians will be convinced if it comes out of a computer, and they in turn will use it to justify the plan to the voters. It is a fairly powerful tool in the hands of planners in convincing others, still it could be used dangerously.

Concerning the use of soft information, he doubted it would ever get into any of these packages for analysis, and perhaps it cannot be used at the moment. We should not convey the impression to planners that information processing through all these techniques reduces the responsibility they eventually have in making a judgement. It will only help their judgement, not eliminate the need for their judgement. That is one of the places that soft information can be used.

Finally, in regard to self-learning components, the rural-regional planning package that L. S. Yapa at AIT is developing will include a self-learning component. In this programme, people will have only one month of training, and afterwards they will have to learn by themselves over and over again.

J. Yabuta raised an observation about the processes being characterized as selections of projects at the local level rather than fancy, sophisticated regional planning. The situation is similar in Japan where they have studies, optimal distributions of population, optimal size of cities, beautiful land-use maps, mesh maps, computerized maps, and so on, but he suspects such are really not used in final project selections, city scenarios, or budget priorities.

It may be that the Sri Lankan situation is more efficient without the high technology or computers. One thing they have is that the people know each other, what project is going on, what agency is doing it, and when it is being done. The central government people, local government people, and the officials somehow know each other. This information interaction is very important rather than the presence or lack of computers to streamline information exchange, although it is limiting.

Also he noted that change is faster than the building of a new information system. In the three or four years it takes a government agency to try to build up a complete list of projects, the situation has changed. People are concerned more with the present action, not with what is on the list that is already obsolete. The change in the world is faster than the speed of making up new viable information.

Hiran Dias responded by noting that while it may be true that the selection process is very often without sophisticated planning mechanisms, they did find that certain projects could have been managed better if they had looked at them differently at the time of selection. He cited the example of poultry projects where they did not have information on the scale or viability or how to arrange them spatially, so it resulted in a scattered and arbitrary pattern that was difficult to service. It could have been more successful if they had planned them better and for that more information was required.

Marvin Manheim suggested that it may be a very important role for UNCRD to promote research to develop software which makes planning relevant and useful. When talking about primarily developing techniques for choosing among projects, everyone probably thinks of a cost-benefit analysis package, but such is hardly relevant in any real decision environment. On the other hand it can be visualized that a set of questions be prepared that people could ask themselves in front of their colleagues and bosses about projects. Such as: If this project is selected, to be effective what actions are required by other ministries? Which of those actions are likely to occur? Response: go back and revise the assessment of the project. This would stimulate a planner or decision maker to think deeply about and make judgements about the desirability of particular projects without a lot of numerical confusion.

Hiran Dias responded, noting that we do not know for sure what software is available, developed already by various organizations. There is no evaluation of this software in terms of what it can do or cannot do. For instance, IBM and the Behaviour Settlement Centre have been working for three years developing a software package for regional planning. They are almost at the end of that particular exercise. Perhaps UNCRD could play a role in terms of gathering this information and making it available and useful.

Hidehiko Sazanami responded to the last two comments by observing that we are facing a challenging issue on how to apply information systems to urban and regional development. Various studies or implementation experiences in planning have been made around the world, and UNCRD would like to organize an expert group meeting or seminar to discuss the successes or failures of such information systems applications in both developed and developing countries. He cited the example of the Hyogo Prefectural Development Proposal which was jointly developed by IBM and Hyogo Prefecture. It was a decision making support system and cost a great deal and took over three years to formulate. It would be interesting to know from Hyogo Prefecture's standpoint what opinion they have about the effectiveness of such a decision making system.

Also there was the case of studies for the estimated future demand for land development in the Tokyo Capital Region, which also cost a lot and took almost three years to make a very comprehensive study. It would be good to ask the scholars and producers engaged in that project to evaluate the outcome. We should also ask about US or UK or developing countries studies, too. Perhaps there is a need for an international seminar to discuss these issues.

GENERAL DISCUSSION

Tuesday, 17 June 1986, 16:30-17:30 hours
Chairperson: Peter Nijkamp
Rapporteur: J. S. Edralin

Peter Nijkamp made it clear from the outset that education for regional planning and informatics training are separate disciplines. Basic education for regional planning does not include informatics. It is therefore desirable that UNCRD offer an application course to supplement the formal educational system and to make up for the deficiency in knowledge.

It also seems clear that information systems are "strictly filtered," in the sense that they tend to focus more on providing quantitative information. Qualitative information that would allow the evaluation of plans or development projects in more qualitative terms is not readily available. It is therefore proposed that training in qualitative information techniques should be provided as qualitative information is a vital component of information systems.

Nijkamp guided the meeting through a review of the trend toward the vanishing dichotomies in information technology. Discussion centred on four aspects:

1. Large-scale vs. Small-scale information systems

   Coexistence

It is believed that information technology allows for the coexistence of large-scale and small-scale information systems as a possibility. Massive, machine-dependent information systems are being replaced by small, flexible information systems. It is felt that training has to focus upon the design of information systems and the needs and problems of data integration. Since information systems differ due to organizational and cultural differences between organizations and countries, a flexible design has to be followed.

2. Experts vs. Decision makers
Fusion

The debate centred on the effect of information technology on the roles of experts and decision makers in information systems design. Nijkamp believed that the inherently flexible quality of small-scale information systems allows the roles of experts and decision makers to be combined, and makes traditional role distinctions obsolete. Others believed that there is a clear distinction between information experts and planners and also between knowledge engineers and information engineers. Experts have an important role to play in regional planning, and their role depends on the type of planning issues faced (e.g., the time horizon, finances, conflicts, impacts, frequency, and uncertainty in the planning process).

3. Resistance vs. Enthusiasm
Reconciliation

Training should take into consideration the psychological needs of regional planners, whose judgment of information technology will be based ultimately on its relevance to the problems they face in planning. The training process should include needs assessment and determination of planner's attitudes about information technology, and also determination of the type of training required by regional planners (e.g., permanent education or institution-based training). It is recognized that the concept of permanent education has less relevance to the informatics sector, as it is inevitable that advances in information technology will reduce the life expectancy of certain occupational skills and make the highly specialized informatics training programme obsolete. It is believed that institution-based training built around basic and generic skills in the information and communication sciences, has much more relevance to the informatics sector. This type of training, when supplemented with opportunities for recurrent education and training, will enable the personnel to gain the technical skills necessary to ensure their entry into new occupational areas.

4. Information Needs vs. Computer Technology

Cohabitation

It is believed that education in an "informatics culture" can make a powerful and instructional impact on a computer-based and information-oriented society. It will stimulate response to the constraints and potentials offered by the "informatics revolution." It will moreover encourage the acceptance of information technology as a tool of change and stimulate the development of information support tools which will make planning more effective. Education in an "informatics culture" should include ex-post evaluation, monitoring policy implementation, and demonstration projects to consider the applicability of their methodology to other subject areas in other nations.

SESSION 8

Wednesday, 18 June 1986, 09:30-10:40 hours

Topic: Information System for Urban and Regional Planning in India:
MMDA Case Study

Speaker: A. Mohamed Ameen

Discussants: John Lindsay
Kenji Oya

Chairperson: R. A. van de Putte

Rapporteur: Aminta Lara-Peters

Discussions on Ameen's presentation: The discussant opined that it would have been very helpful had the case study presentations been scheduled earlier so as to provide a concrete basis for discussion. He felt that the question raised by Ameen about the relationship between the metropolitan development authority and the federal government was very useful, and that it would have also been useful had he indicated the results of the course conducted by the Tamil Nadu State Government.

The discussant praised Ameen's useful introduction to the complexity of agencies which are involved in the creation and organization of information, and of the problems with the relationships and flows of information among them; he added that it would be very helpful to also separate the information requirements at the inventory, activity, and implementing levels, and cited some additional things that should have also been included, such as the need to conduct a staff skills assessment early enough in the stage to help pinpoint the various skills and gaps; identify the systems, skills, statistics, mapping, and dissemination; and provide basic accountancy and financial management. As all data costs money, it was felt that the economics of information is an area that merits some attention. It was agreed that Ameen raised the right kinds of questions, and that his conclusion regarding the need to identify a mechanism through which the MMDA could develop an information strategy was a very pertinent point to consider.

The idea that the manual system needs to be tightened was said to be undoubtedly accurate, except that the financial component needs to be added; in other words, the manual systems need to be costed, the discussant said, as it may very well be that many manual systems should remain manual because they function best and are most cost-effective that way. Thus, rather than thinking of moving from manual to computerized systems, it was contended that one or two of the areas of information organization need to be identified which most lend themselves to the facilities of computerization already available in 8 and 16 bit machines and microcomputer packages with which the Indian computer industry is already dealing, being that the Indian Government has placed restraints on the import of large computer systems.

It was pointed out that there is a strong argument for identifying small-scale operations and taking those as prototypes for developing an evolutionary design methodology. Distinct advantages of a data base over a register were recognized, and the changeover from a manual register to a data base was said to be a jump from quantity to quality in what can be done with information. A project register with the beginnings of possibly some financial accounting component to it, it was contended, could well be the sort of prototype which would give people some experience of actually starting out with 8 bit machines, simple software, and the beginnings of building up a small data base and information management skills which would also be useful to different agencies. A word of caution was issued on the pitfall of setting up an information unit which is different from the analysing and executing units, as that would create a cupboard in the corner that would fail to be coherent with the other institutions; it merely becomes a box into which problems and problem people are put, obstructing coordination. Financial management and accounting which puts a cost on all information was felt to be an effective mechanism for avoiding this pitfall.

Concern was expressed over the institutional arrangements for IS. It was said that when discussing IS for planning, too much attention tends to be given to hardware and physical infrastructure considerations of IS, to the neglect of institutional arrangement aspects which are just as important. The purpose for which IS are designed and organized in the context of plan formulation and implementation management, it was pointed out, is to promote a rational judgmental process, to make rational decisions, or to coordinate or integrate conflicting interests of different entities. Thus, it was added, institutional arrangements are another side of the planning institutional framework. The discussant felt that planners should have more say on what kind of IS is required, and that at the same time planners should think more about what kind of institutional device would be suitable to mobilize the information available in the various implementing agencies. It was pointed out that many agencies in the Madras Metro area have a wealth of information and data which are not adequately tapped, and that it is thus important to device certain strategic institutions whereby those on top as well as the hidden resources can be fully mobilized.

The discussant advocated the promotion of a small interdepartmental flow of information. As pointed out, each unit works in isolation from other units in information collection, processing, dissemination, and so on. In order to facilitate a smooth interdepartmental flow of data and information, an institutional mechanism towards this end was advocated that would eventually facilitate the involvement of sectoral implementing agencies in the process of planning and implementation management. Thus, it was said that information could be used as a strategy towards facilitating the coordination and implementation of sectoral agencies. In this regard, some questions were directed to Ameen to elaborate more on current efforts on the part of MMDA to establish IS, and on what attempts have been made regarding institutional arrangements for developing viable IS for metropolitan planning. The discussant emphasized that this second point refers to information as a strategy for promoting popular participation, as MMDA deals with slum and squatter improvement and such projects require a two-way flow of communication between government and the community to which assistance is directed. In this context, it was added, plans made on the part of the government are imposed on the local community, which tends to diminish the cooperation required from the local community. It was believed that as part of the overall IS for planning and implementation management, it is possible to use information as a strategy for promoting popular participation.

The discussant commented on training for IS. The required capability of personnel to be engaged in the development and management of IS was pointed out, and the major areas of capability development were outlined. In addition to these knowledge and skills, he pointed out that it is also important to include attitudinal and behavioural aspects because in dealing with information we have to deal with different parties, entities, and orientations, and in collecting, processing, and disseminating information, these come into some sort of contact. It was felt that those involved in IS should have some capability for dealing with raw information generators and information use.

Another discussant said that Ameen's case study helps us see the issues clearly: If one looks at the staffing plan and the mission given that group, it clearly reflects a philosophy that the priority is to develop an urban and regional IS, and this philosophy reflects the idea that the most important way to do planning is to collect large volumes of data in a relatively homogeneous, uniform system. That is one popular view of planning, the discussant said, and he would like to contrast that with an action-oriented view which also has some specific implications for how to organize and staff that unit. He proceeded by saying that another way to approach the role of IS in an agency is to go around and interview each of the senior officials in the agency and ask them what they think the agency must do to be effective over the next three to four years and also what they think they as senior managers must do to be effective. This was said to be called the use of "critical success factors." After this, it was advocated that, as earlier suggested, microcomputers and end-user support software be utilized to organize the staff so that each staff person in the information unit supports one or two senior managers and develop decision aids to make maximum use of limited available inconsistent data. Development aids for each senior manager, it was emphasized, should be on project management, financial issues (i.e., finances of the agency and of the implementing agencies), monitoring, political issues, as well as participation processes; and it was added that many simple techniques might be developed that may be perceived as useful. It was felt that over time, being effective in this way would create a constituency for information coordination which in the end may have a higher probability of achieving an integrated urban and regional IS as the first objective. The staffing agenda might involve some of the same skills, but it was thought that there might be more emphasis put on people who can communicate with and listen to senior managers; on people who can develop simple software applications quickly, rather than on sophisticated management IS and operations research models; and on people who are very entrepreneurial, dynamic, and creative, rather than on very sophisticated technicians. The point was reiterated that the case study helped define the issues very clearly, but the discussant sees significant differences in the mission to be assigned to the unit, the way it will operate, and the staffing which will reflect the different philosophies that have been discussed at this meeting.

The lessons of British and Dutch planning agencies were said to indicate a turning away from the detached research and intelligence kind of service, and it was said to be a step towards creating an environment for information coordination in the medium- and longer-term, as argued earlier. The enormous diversity of approaches was pointed out on different age groups' attitudes towards information management and monitoring and evaluation. One extreme approach was said to be the information research intelligence function through the use of technical services, information services, and the like. The other extreme approach was said to be concerned with a high degree of integrated implementation activities with information connexion interviews with senior managers and so forth, which are not even microcomputer-based. The importance of looking at the relative strengths and weaknesses of these extreme approaches to agencies' activities was stressed. The British experience in the field of monitoring and evaluation, it was said, points to a trend towards a degree of integration between the information function and the implementation activity, and not with the creation of a detached research and intelligence or technical service. The reason for this, it was added, is that there is a great deal of hostility in other parts of planning agencies against a detached, remote, evaluative research and intelligence partner, as well as hostility against accepting their recommendations. The strengths and weaknesses of this approach are important considerations in the development of organizational capabilities. An advantage of the integrative approach is that rather than just developing technicians and specialists, it was pointed that the people's capabilities are developed through their direct involvement in planning and information processing. Although the closeness of this approach to such considerations makes it difficult for people to really look at things critically, it can nevertheless foster credibility and acceptability.

It was also observed that Ameen's presentation referred mainly to the urban situation, and mention was made of programmes that have already been launched in India to establish some IS in the rural areas as well. Important efforts were cited in this direction -- the Natural Resources Data Management System (NRDMS), the software package for district planning (GRIDS) developed by the Planning Commission, and the Computerized Rural Information System Project (CRISP). Mention was also made of an integrated approach to training; the operationalization of such an integrated training programme was said to consist of a core curriculum whereby a heterogeneous group requiring different kinds of orientations and skills undergoes similar training, followed by training in specialized areas according to the groups' heterogeneity and the trainers' expertise.

Mention was made of an important conflict with regards to the interests of the different agencies which deal with information and the planners who need information for a more integrated kind of approach to the problems of planning. The discussant said that he did not see those conflicts in terms of technology, but rather as basically an organizational problem which had been referred to earlier in this presentation. The need was expressed for more integrated training of all the people involved so that they can appreciate each other's needs; and the need to communicate information was said to require a certain amount of information design which would make it possible to communicate, because if one collects information on the basis of words while someone else bases his information on something else, it is not possible to communicate on the basis of that kind of information alone. There must be some understanding it was felt, about the way information is collected, organized, and communicated. Such problems were said to remain in spite of the introduction of more advanced IT, and were thought necessary to solve through training or with precision at the IS stage. IT, on the other hand, was thought to support the use of information in more flexible and useful ways, and the problems of timeliness were felt to be possible to improve to some extent as a result of this. Thus, separate problems in terms of training were recognized that do not relate to each other and which must be considered in any training plans.

Ameen's Reply: Ameen expressed agreement with the view about the importance of costing one's manual system prior to switching over to a computerized one, and said that this would be carefully considered in setting up the system in Madras. He also agreed with Manheim that small-scale operations should be such that they aid decisions, and cited the use of the spread sheet suggested by Manheim to work out different alternatives which can be successfully used in introducing small-scale computerization in this area. With regards to the question on data being less variable in the rural than in the urban areas, Ameen pointed out that although this may not be the case in other areas, it was certainly so in the situation he studied. He also clarified that what he meant to say was that since development in the village does not tend to be very dynamic, the situation seems to be less variable in the rural setup than in the urban areas.

SESSION 9

Wednesday, 18 June 1986, 10:50-12:00 hours

Topic: A Case Study on Information System for Local and Regional Planning in Rapti IRD Project, Nepal

Speaker: Heera Raj Regmi

Discussants: Teitaro Kitamura
Hitoshi Yonekura

Chairperson: John Lindsay

Rapporteur: James A. Jolly

Heera Raj Regmi opened his presentation with reference to the goals of the Rapti Integrated Rural Development Project (Rapti IRDP). His presentation is aimed primarily to the context of the Rapti IRDP and not to the country of Nepal as a whole, although he also referred to the latter. Partly funded from a grant from the U.S. government to Nepal, the Rapti IRDP seeks to improve food production (hopefully by as much as 25 per cent per person), improve and increase income generating opportunities, strengthen local capacity to plan, implement, and sustain local development, and increase availability and use of national delivery systems in the zone.

Rapti is one of fourteen administrative zones in Nepal. Located in the heart of the country, it comprises about 10,482 km^2 and has about 1.5 million population. It is subdivided into five districts, four of which are sparsely populated mountain regions. The fifth and main district of Dang contains 30 per cent of the zone's population on 12 per cent of the land. The national highway (Mahendra Raj Marg) through the zone is operable year round, but other roads are usable only in winter and summer.

Nepal is now in its seventh five-year plan, which is administered in a formal organizational framework. At the top is the Development Council (headed by the King) which meets once a year and provides guidance and review to the National Planning Commission (NPC), the main planning, monitoring, and evaluating organ of development activities. It meets trimesterly to establish policy on and review national (centrally administered) and local (district or village) projects.

Policy guidance and budget ceilings are channelled through the ministerial departments to the regional and zonal offices to the district levels for plan formulation. Planning starts at the zonal office and is submitted to the district panchayat after soliciting local citizens' participation at village panchayats and assemblies. Approved plans are submitted back up through the system. If districts cannot come up with their own plans, then whatever plans are necessary are made at the central level and sent down to the districts.

The Rapti IRDP follows much the same process. The donor agency (USAID/N) consults with the Ministry of Finance and the National Planning Commission to review the prior year's progress and to set the budget ceiling and programmes for the new year. These guidelines and budget ceilings are routed to the Project Coordinator's Office (PCO) which disseminates them to zonal and district levels of the line agencies. At the local level, specific plans are formulated, approved, and submitted to the PCO which reviews and comments and passes them on to the IRD Board at ministerial level for approval.

The objectives of the information system in the Rapti IRDP is to keep up-to-date records on the physical progress of plans and the financial status of each project. An Apple IIe computer is now used to assist in this task. The main problems encountered were the lack of uniformity of the target or progress unit, difficulty of expressing progress in terms of verbal language where numerical expressions were not adequate, difficulty of indicating problems within the limited format, and the lack of properly trained and knowledgeable manpower.

In implementation of the information system, the planning cycle essentially begins with the preparation of policy guidelines at the central level in October or November, processing through the PCO in December, local-level processing in January or February, back up to districts and out to NPC by the end of March, approval review by PCO in April and May, and final approval of Ministry of Finance in June or July and with final approval the guidelines are disseminated in July and August. The fiscal year ends on July 15.

In the monitoring cycle, the trimester progress reports for ministerial review meetings are important. Financial status is reported monthly. The trimester report is useful in coordinating, but again lack of trained manpower and equipment are problems of the system. The PCO has no control as it is advisory only. At the district level, all information processing is manual. There the turnover of personnel is every three or four months, and personnel sent out for training rarely return to their office; so the Project is always suffering from inadequate manpower.

Organizationally there seems to be little enforcement power. District level data is indispensable, yet if it is late or incorrect, there have been no instances where disciplinary action has been taken. Basic information is not yet flowing regularly. With the 1986-87 Plan, Rapti IRDP is going to prepare village profiles, after which previously planned district profiles can be completed. The Planning Commission hopes to prepare these on a computerized basis, yet in practice planning at the village level is very difficult because of the communication gap between village and districts. No dialogue has been taking place.

In the creation of data and information bases, the panchayat surveys are most important for village data to be used for planning purposes. These surveys are conducted through the agriculture specialists. Also special surveys are made by contract consultants and expatriate specialists. Information collected directly by line agency is more reliable, whereas data collected from indirect sources is not so reliable. Resources like relevant equipment and incentives for the people who are involved in data collection and processing are needed in the Rapti Zone. With the new technology, the village level workers especially should have some training in data collection methodology and be provided incentives for higher motivation in their work.

In the Rapti IRDP a simple filing system is the most common means of storing data. At the PCO and USAID/N offices, two computers are being used to try to store data on computer diskettes. PCO is trying to store physical and financial progress data at the zonal level of the line agencies in the computer. Since it has been hard to retrieve data on a timely basis from the filing system, the computer system is hoped to help speed up information retrieval.

In using the information produced in the system, the collected data is used to a limited extent in decision making and planning processes. That data comes mostly from the Rapti IRDP and the line agencies. Some progress reports from the system are implemented and some are not. Some are even dropped by the line agencies. For example, the Rapti IRDP report of 1983 indicated that the education component was very low, so the donor agency and Ministry of Finance decided not to programme any education funds for 1984 and 1985.

The training requirements for the use and application of the information system is the most important consideration. In the Rapti IRDP situation, training is the most important thing, especially computer training. Two personnel from Rapti IRDP have been trained in word processing, eight radio operators were trained for use in relaying information from districts to the PCO and central offices, and some field staff were trained for agricultural extension. The continued need for training appears at the village level in the need to be trained in collecting data; at the district level, the line agency people need training for analysing and forwarding data; and at the zonal level, the need is for computer training since this is where computer systems will be introduced, initially as simple operations.

In closing his presentation, Regmi cited the problems of training that they were facing. Essentially these revolve around the insufficiency of manpower, i.e., lack of proper trainers, training materials are inadequate, identification of the type of training needed by development workers is difficult, and the educational background of most is not sufficient in that trainees are often minimally qualified.

In commenting on Regmi's presentation, Teitaro Kitamura observed that how to get the information is a difficult situation in respect to planning for establishing an information system in situations where data is lacking, especially in developing countries. Since there is no system for statistics initially, and under these circumstances most of the personnel may not understand the planning process, we should scientifically design the information system along the two aspects of legitimizing the target and devising and implementing the means or procedures. In the situation where data is lacking, first it will be necessary to enlist the aid of a lot of village persons and officials to gather statistical data. Secondly, it is necessary to make a planning-oriented information system, perhaps initially as a manual system and then later on as one which would use computers.

In this regard, it is necessary that training focus on how to gather statistical data. An example from Japan is the use of the Agricultural Census, which utilizes a small Agricultural Statement Card to record statistics on agriculture activities. Entries on the card include statistical items such as number of farmers, areas, animals, and the like. This card becomes a kind of data bank for rural planning. Therefore, in the first instance, it is important that the villagers know how to enter the statistics. Once the procedure is established and understood at this basic processing level, then the system can gradually be computerized.

His next point concerned the suggestion that impact evaluation may be appropriate early in this work. One way to get around the difficulties of this in developing countries would be to use a case study approach. Begin with a trial plan for a small village or district and get experiences in planning and making targets. Probably you will soon recognize what methods are effective and what data is most important for planning work. Through such impact evaluation, there is opportunity to test data as to which is the most important and should be sought out in the future.

Finally, Kitamura proposed that UNCRD make basic manuals for this kind of case study work, including manuals for trainers. At the beginning these should be most simplified, then step by step made more complicated, in line with Sundaram's suggestion for a core manual with others for specific areas.

Hitoshi Yonekura commented that the qualitative or language information at the village level was particularly interesting in the context of the many problems and constraints on development in Nepal. The Agricultural Development Offices are exemplified as the basic offices for collection of data at the village level. At the village level the agricultural and livestock extension worker directly contacts the farmers and villagers. They have extensive and intensive knowledge and experience about the locality and various kinds of practices in the village.

This is similar to Indonesia where each village has an extension worker who lives in the village and everyday has contact with farmers and exchanges information about agriculture or other facets of daily life. In Japan also the extension worker has lots of information about the villages and communities, and he sometimes has very strong personal relations with local families, so much so that occasionally he may act as matchmaker for a bride and groom.

So at the bottom level, the extension worker in the village is a very useful source of information, and maybe sometimes he will even know the people's attitude toward government programmes and policies. In the report, the field extension worker for agriculture or livestock have regular monthly meetings at the district centre. This meeting must provide very important opportunity to collect grassroot information. Maybe in this monthly meeting statistical data, such as productivity, planning area, or agriculture imputs may be collected and combined. If those statistical data are not enough to understand the community level situation, informal or language data of each extension worker should be reported and combined at the district level. Extension worker collected data may be rather easy to input into a computer, and he is rather optimistic about the application of microcomputers at the district level or for those extension workers.

In regard to language or qualitative information included in many kinds of reports (feasibility studies, implementation reports, operational or maintenance reports, monthly or annual progress reports, or even the village and district profiles mentioned in the paper), he suggested that these not only include the traditional information, but the possible conflicts within the village or conflicts between district and villages or even such things as judicial precedences concerning land expropriation by government. Such data can also be very important for the promotion and implementation of rural development projects. He asked if such data would be readily available in the manner it is stored in Nepal, and could foreigners or consultants be able to extract such information for post evaluation of projects or for learning the lessons of a project.

Documentation is a very important issue, since it will make computerization possible. Citing his experience in Indonesia, he noted that sometimes in visits to the Ministry of Public Works the reports and information would be stacked in huge piles of project data, but there would be no completed index cards for such. Accordingly, any research required the direct review of the raw data without the aid of any systemized library assistance. So the inclusion of proper information infrastructure, such as an index card system for classifying data, is important to the smooth operation of the rural development project.

Finally, concerning decentralization in Nepal, if it is along the lines of normal meaning where decision making is handed over to the local government, there is some danger of the involvement of many pressure groups or influential persons who may interfere with the local government's decision making process. In planning it is very important to protect the consistency among the various policies or rationalities from the viewpoint of economics or the like. So the decision makers must be prepared to stand up against any irrational political pressures. Of course, sometimes compromise with the pressure or interference might be necessary, but consistency must be maintained in order to achieve the desired result of the plan. He wondered if they were able to maintain this consistency or rationality in the Nepal situation.

In the discussions, Hiran Dias noted that the Rapti IRDP has a decentralized setup where district level plans are originated at villages, sent up to district for review, and then sent on up to central government. However he suspects in this situation that the kind of information that is used initially is very informal, which the village people themselves have and is not on record anywhere at all. Rather it is a kind of information which probably comes through informal discussion and through their own community network. Whether that system is what happens in most cases compared to the formal type is the question.

In his experience in Indonesia, he observed that in some subvillages there were large bulletin boards on which all sorts of data were posted on how many cattle, how many acres of this or that, how many people are traders — all seemed well organized, although maybe it was an unrelated system of information at the village level. Still this did not seem to be used for any purpose. Often there is this kind of information. So you have two different kinds of systems, such as in Indonesia where they seem to have originated all kinds of data collection in a formal or systematic way, although that may not be the best system, and not used for planning purposes; and then you have the Nepal situation where you have projects originated without any formal information system at the village level.

Linda K. Carlisle noted that the paper mentioned that the literacy rate is less than 30 per cent of the country, and so the knowledge of English would be considerably less than what one would suspect. It seems that if the systems proposed were such that the instructions or forms and the like are in English, such would be a very limiting factor on how effective and productive the system could be.

John Lindsay posed a question related to the activity of the foreign and often private aid agencies. For example, Action Aid has put something like US$5 million into a five-year development programme for a population of maybe 50,000 people. He wondered what sort of information and at what level would you gather it to be able to assess the economic impact of that sort of charitable intervention. How would you come to the decision of whether in fact that sort of foreign aid intervention, over which the government has quite limited control, is in fact beneficial or harmful to the particular areas?

Heera Raj Regmi, in response to the comments and questions presented, noted first his appreciation of the suggestion by Kitamura as to the making of village cards as initial data storage and then trying to computerize such. He noted that it will be necessary in any event to make sure that the right data is picked up. As Manheim had suggested previously, the important thing is picking up information from the whole body of information. Also basic manuals on how to collect the basic information and to provide guidelines will eventually be needed.

As to the suggestions of Yonekura on the question of collecting information, they are using field workers in the collection of data through direct contact with the villagers. The field workers can then observe directly what is happening and what the farmers are doing. As in the use of seeds, they see how much is being used. If they have to rely, as in other cases, on the information from the distribution points or cooperatives, it might not be so reliable. These record sources show how much is sent out, but not what is used. For example, the quantity of fertilizer distributed for crops may be greater than that actually used for such, since some may be used for other things and not for crops.

Another point here is that before the Project was started, each field worker had to see about 2,100 households in his area of service. After the Project was started, it was still at a level of 1,200. It is difficult to imagine how a field worker could possibly see them once a week, or once a month, or even once every six months. He will have to cover three or four panchayats, and just to travel from one corner of his territory to the other corner will take about one week. So to give time for the farmers to discuss problems with him, to go to the fields, to be guided here and there, just does not permit him to be able to collect all the actual data from the field. That is why the monthly meetings are used for the exchange of information, and they cannot have all the real information. Timing may be also off, since he may not be able to visit a certain village when they are experiencing a disease in the crops. For the collection of better data, they must minimize the number of households per field worker.

If there was some scientific way to collect data, then it might be considered more reliable, but now they cannot tell what reliability these data have. For example, in 1981 when all the field workers' district reports on the new improved variety of seeds and fertilizer were aggregated, the total land area supposedly seeded exceeded the total area for that district. In the programme now being tried, they have no experience as yet, so the success of overcoming these problems cannot be told yet. Right now the purpose is to involve the people through the panchayat. That is why the authority to implement the programmes have gone to the panchayats. The authority to control the finances is still with the bureaucrats, but the politicians have the planning and evaluation authority.

It was acknowledged that politicians may manipulate the experts and promote their own interests for projects. However some planning must be done and will have to go forward even if the data is insufficient.

Illiteracy is very much a recognized problem. In most villages among the poor it is below 10 per cent. Participation is very little and difficult because of this. Efforts are being made to improve the situation, and there has been some increase in the literacy level in the country recently. They hope to continue this trend.

SESSION 10

Wednesday, 18 June 1986, 14:00-15:10 hours

Topic: Assessment of Training Needs on the Use and Application of Information System for Local and Regional Planning (Pakistan Case Study)

Speaker: A. S. Bokhari

Discussants: Peter Nijkamp
Jin'ichiro Yabuta

Chairperson: John Lindsay

Rapporteur: James A. Jolly

A. S. Bokhari began his presentation by noting that there were three components implied by the title of his paper: planning for regional and local levels, information systems (which should support planning at both levels), and techniques involved in these. Pakistan, like other developing countries, has its own problems in these three things.

First there is a need to understand in the context of Pakistan, what is meant by regional and local planning, and how the information system is structured to meet the needs of such planning at different levels, particularly as to the hard core of economic and social causal relationships which need to be improved through various training programmes.

The administrative structure of Pakistan is basically a federal system with considerable authority delegated to provincial governments. There are four provinces and three federally administered areas, with responsibilities divided by the 1973 Constitution into federal, provincial, and concurrent lists. The "Federal List" consists of exclusive decision making responsibilities such as defence, imports and exports, foreign exchange, and the like. All others not being expressly concurrent, fall within the determinative powers of the provinces. Concurrent jurisdiction lies mostly in the social and economic infrastructural areas such as health, water supply, or electrification. In concurrent matters, the central government plays a policy and coordinating role, but the provinces do the planning.

Territorially, the country is divided below the provinces and federal units into twenty divisions, which in turn consist of eighty-eight districts, 275 "tehsils," 4,100 union councils, and 46,894 villages. The grass roots is in the villages, and it is there that the impact of economic and social development is meant to reach. When talking of regional development in the context of Pakistan, it means the provincial level.

It is the district where local plans are considered. Attempts have been made to bring this down to the level of the union council, but constraints of finances, lack of technical manpower, and the like have caused this to be confined for the time being to the district as far as local-level planning is concerned.

It is universally recognized that mere economic development is not sufficient, and it should be accompanied by distributed justice. This has led to reorientation of the planning process from top-down to bottom-up approach, to involve people in programme planning through execution and evaluation. With this in view, in 1979 the Government of Pakistan promulgated the local government ordinances and held elections to local government institutions at the union level and district level on a direct vote franchise basis. The idea was to create elected bodies which can take care of and articulate the needs of the people, and which can identify the priorities and take on themselves the responsibility of spearheading a development programme at the local level. Fairly substantial authority has been given so far as planning is concerned, but also some authority is given to levy their own taxes and raise resources so as to match the responsibilities with the resources. These institutions have become fairly well-entrenched and further validated by the 1983 elections. They have suffered some slight setback in that districts as well as union councils are drawing upon the same resources and constituency. These problems are being solved, and it does not seem that it should cause great problems for planning at the district or the provincial levels.

The National Economic Council (NEC) is the organizational mechanism for planning, with the Prime Minister as its chairman, and it is responsible for all economic policies (even statistical and information policies). It is supported by an Executive Committee (the ECNEC) of which the Minister for Finance and Economic Affairs is the chairman. He is also going to be the chairman of the information system. ECNEC is the supreme body responsible for planning and development activities in the country.

At the federal level, projects are formulated by ministries and come down to the Planning and Development Division, where they are processed and examined technically, looking into feasibility, finding resources, and so forth. They are then approved if given the confidence of the Central Development Committee up to a certain economic level, otherwise beyond that the ECNEC handles final approval.

At the provincial level, there are departmental offices corresponding to the ministries at the national level, which are responsible for making their own suggestions and programmes and projects for approval by the provincial-level planning and development working party. There is no organization at this level (provincial or district level) which can make a development policy decision or alter priorities.

At the district level there are sectoral departments in the line ministries. These are field arms located at each district level. These departments, together with the District Council which is an elected body, constitute the District Coordination Committee to process the project and planning formulation at the district level.

For meaningful planning one certainly needs information and relevant data. People are obsessed with the idea that there is a lack of data in developing countries, but the speaker (Bokhari) cannot perhaps contribute to such an idea. There is no lack of data as such; rather a better wording would be to say that there is a lack of relevant data. There is plenty of data, but people do not know what to do with that data because it is in such a crude form that they cannot make use of it readily. The need is to organize data collection and processing at the district level in a manner that it becomes readily usable by the users. Plenty of data is lying around in bits and pieces in different agencies and departments of government, nongovernment organizations, or cooperative societies, which they have been collecting over the years. It is available, but just not in a form that one could use straightaway for the preparation of a plan.

The structure of information system corresponds to the planning organization. There is a National Statistical Council (NSC) at the federal level, under the charge of the Minister for Finance and Economic Affairs, who is also responsible for all planning activities in the country. The Council provides the first forum to all agencies, both planning as well as the information agencies in the country, to interact at the national level to find out what is needed, where it is needed, when it is needed, and what is the cost-benefit of that information.

The NEC is supported by a Statistics Division and by the Technical Advisory Committee. This provides the second forum where the users and producers of data can interact together to find out what, when, where, and why data is needed and monitor the quality of that collected.

Before a work plan (normally five-year plans corresponding to the five-year economic development plans) for the collection of information is made for the country, all agencies are called upon to submit their data requirements for the next five years. The Technical Advisory Committee, whose members are specialists in their respective subjects, meets to scrutinize the requests from the point of view of cost-benefit, cost effectiveness, and relevance.

The Statistics Division is the main administrative division controlling or organizing the information system throughout the country. Under this there are three attached departments which are located in the provinces. One is the Agricultural Census Organization which covers everything relating to agriculture (livestock, forestry, fishing, land, etc.) and is located in the province of Lahore. Next is the Federal Bureau of Statistics which is the technical wing of the Statistics Division and is located at Karachi. The third is the Population Census Organization. Prior to 1969-70 when the system was designed with the help of the World Bank, all the data organizations were in various ministries and had no link whatsoever with the planning mechanism in the country. Now by bringing them under the NSC and making them detached departments of the Statistics Division, they have been brought under one umbrella and under one discipline. They have their field arms at the field office at the Division Headquarters, but not at all districts. In all the divisional headquarters, there are twenty field offices.

The lacuna in this is that whereas local-level planning is being eliminated at the divisional headquarters level and being consigned to the district headquarters, the information system has not gone down to the district level to provide the requisite data for the purposes of planning.

When the system was designed and the reorganization took place, legal cover was provided by four legislative acts in order to create official statistical authorities all over the country, who could collect data and were empowered to go and knock at the door of a house, identify themselves as enumerators, and the occupant would be required to provide them with whatever data is required.

When we are talking of original planning and local-level planning, the question to be posed is what is the information that is required and which the information system is supposed to provide. Particularly in the context of rural development, since a bulk of Pakistan's population lives in rural areas, and 72 per cent of the economy is in the rural sector, a basic question to be addressed is: What is the information required, who will collect it, how will it be collected, and how will it be processed and made into a form which is acceptable?

Information can be divided into three categories of physical and biological aspects. The first category is Physical and Biological Resources, i.e., those that are particular to the area, region, or district for which a plan is to be made. Statistics are needed on agricultural land use; land utilization patterns; area, production, and yield of crops; irrigation and water resources; supply of inputs; market trends; activities allied to agriculture; veterinary services; fisheries; forestry; industries and employment patterns, and the like. For each of these, there must be a complete inventory with a benchmark starting from a particular year. Pakistan is fortunate to have 1980 as its benchmark, when it was decided to undertake monitoring of statistics, keeping a required inventory, and trying to update it every two years. It has statistics which can tell information with a fair degree of accuracy. Some censuses are of other intervals, five or ten years, but still fairly regularly taken.

The second broad category is Human Resources. These will be information on population (sex, age groups, urban or rural, etc.); literacy; patterns of working force; landlessness; labour; artisan; or skills. Thus officials formulate policies on manpower, education, health programmes, supply of drinking water, communications facilities, and the like. Also it will give them knowledge of what skills are available and how distribution of such is among the various people and regions. For the information that is required for regional development, this would be a minimum perhaps. There must be some minimum, and there is no maximum as to what must be available at the regional and district level so that planners can formulate some meaningful plans which can be implemented or repeated after five years.

The third category is Infrastructure and Institutions, i.e, electrification, communication infrastructure, water supply infrastructure, schools and buildings, banking, and the like. This listing is only as a minimum reference for a worthwhile plan at the regional, district, or local level.

In the field of programme planning and project management, an integrated information system has been the primary goal of the Government of Pakistan. How is this achieved? On the one hand, a five-year plan for national development is prepared. On the other, a five-year work plan for censuses and surveys is prepared in consultation with the planning and project agencies and departments, and of course, spelled out by users. It is examined to see if it is cost-effective, and such issues as what level of disaggregation and what should be the priorities are decided in meetings of technical advisers and the planning councils. It is symbiotic since both depend upon each other.

Looking then at the area of training needs, for those functionaries who are engaged in statistical programmes of data collection and processing, the information system implies a major transformation. It means not only the integration of conceptual base with statistical and analytical competence, but also the provision of linkages between policy instruments and man-made machine simulation of economic processes. The only way it can be effective is to expose the functionaries to extensive training in principles, procedures, and professional competence of the system. Training has to be considered at various levels for various groups of functionaries. Generally there are three levels.

The primary level is the undergraduate group, like the statistical assistants, the survey officers, field enumerators, and census officers. They have to be trained in fields like data collection, screening, compiling, processing, computing, and so on.

The intermediate level is the most important level for information systems, even more important than policymakers, as they are the persons who really turn out the data for the use of the various agencies. If there is a defect, that defect is going to be reflected in the reports that are disseminated. Particular care has to be taken in training these people. They are mostly graduates holding masters' degrees in statistics, mathematics, economics, or sociology. They are statistical investigators, statistical officers, processors, computer programmers, systems analysts, or engineers. Most of the technical operations are performed by these specialists. They need to be exposed to orientation which makes their job specific.

The third level is that of the senior officials — directors, deputies, project managers, or chiefs of sections. Of course, they are experienced persons. They, too, need to be exposed, and the type of training they require would depend on various functions they are performing in their respective agencies.

For all three groups, primary, intermediate, or supervisory, the listing of needs could be quite extensive, depending upon how long they can be spared from their duties. Supervisors may only be available for two days. Intermediate persons may be available for at least two weeks. Only the primary, undergraduate group working at the grass roots level can be spared for longer periods. The suggested listing of training was: delineating minimum data requirements for regional planning; formulation and standardization of questionnaires; sampling techniques; sample surveys, household surveys, or rapid appraisal surveys; mapping; use of administrative records; community-level statistics; techniques of data processing; testing analytical framework; procedures for checking consistency of data; data requirements, such as storage, preservation, or dissemination; systems management; software development; division of data base; and so forth.

The Federal Bureau of Statistics, which is the technical wing of the Statistics Division, has been thinking of creating a data bank for rural development. The entire statistical system at the national level is computerized. The statistical system at the provincial level is partially computerized. However, the statistical system at the district level is totally manual, because Pakistan does not have the manpower, the know-how, or the finances to proliferate these facilities and services down to the district level, although it would very much like to do so. A bulk of the data is generated at that level, which is passed on to the higher levels and is reflected in regional and national plans. The quality of the plan at the district or provincial level depends upon the accuracy of the information collected at that level. With regards to the creation of a data bank for rural development particularly, a lot of money is required to collect data. Not much headway has been made, but there is some negotiations going on between the World Bank and the Bureau of Statistics to explore possible help in this regard.

Peter Nijkamp found the paper a good overview of the Pakistan system, containing a wealth of information. It was especially interesting being placed in an economic, historical, and political context. It was made clear that the way the system was being designed, and has been designed so far, is very much reflective of the features of the developing countries, with a strong orientation toward agriculture on the one hand and facing urban problems on the other. This typical dichotomy or duality is embedded in the way this case for Pakistan was discussed. The orientation toward decision making was also interesting, especially the concept that villages are the key elements in the decision making process, starting from the bottom-up approach.

Mention is made in the paper of training needs in statistics, data collection, and the like in several places. There is a strong feeling that this was particularly addressed to issues of purely statistical data. The question here, however, is not only the inventory of data as such, but the way they have to be treated, the way they have to be designed so as to make them suitable for policy analysis and planning. So in addition to data inventory and data collection, one would also need some training in more advanced statistics, like data treatment, and including modelling. What kinds of forecasting methods are being used in this respect? The government is probably not only interested in population figures as such, but it may be more interested in population figures in the year 2000. That requires a specific type of statistical training which could be a logical follow-up of the huge data bases which are being set up. The way in which the data base has to be set up very much depends upon the ultimate analytical exercises which have to be based on those statistical data bases. So more information might be had on how these data bases serve planners who need to take care of the needs of society in ten or twenty years.

Attention so far has been on all kinds of public facilities (e.g., roads, hospitals, water supply, or electricity). Many other countries establishing information systems which include huge amounts of structured data on all kinds of amenities and facilities (shops, educational systems, etc.), are using a dual coding approach to arrive at a consistent representation of all this data. We would like to hear about advances in this respect, especially how it relates to different levels of decision making.

Page 19 of the report contains the remark about ambitious information systems being "comprehensive and well integrated." However from what is reported, it does not seem evident what the integration is. If one looks into the way it has been designed, it still leaves some doubts. For instance, how is an information system based on land registration system linked to such things as amenities, housing programmes, or environmental information at different levels? How are geographical scales made consistent vis-à-vis each other? How is the precision of measurement made consistent? How are people to be trained in respect to building such an integrated, comprehensive information system?

Monitoring of information was mentioned and is a very important element. While mention is made of the bottom-up approach in terms of policy making, the way the data are collected in terms of advanced information technology seems more centralized. At the central level the data system is computerized, then it slowly changes as one goes down the hierarchy; at the village level, manually driven systems are common. So there might be some coordination problems, and the question is in fact who is taking care of monitoring? Is it the responsibility of villages or regions which have to do it in a manual way, or is the responsibility that of the central government which has to do it in a computerized way? Here one can foresee some coordination problems which are well known, as in Indonesia.

Concerning the mention of "inputters," in addition one might also have "through putters" and "outputters." In this respect and in terms of inputters, a lot of efforts have been made so far in Pakistan. In terms of through putters and training, considerable progress has also been made. In terms of outputters, the way this is being used by action-oriented planners, there does not seem to be that much information yet, and maybe further comment can be made.

In posing a final question, Nijkamp made reference to the remark appearing on page 51 of the report: "The failure of the traditional system and recent advances in computer sciences have contributed to the emergence of system dynamics school of thought." It seems to refer here to the structural changes in society. Pakistan at the moment is very much an agricultural oriented society. However, who gives the guarantee that in the year 2000 Pakistan will still be an agricultural oriented society? Who could give guarantees that the system being built up now, which is very much focusing on rural problems, is still flexible enough in the year 2000 to encapsulate maybe totally different issues. Maybe Pakistan by then will have become a tertiary oriented society. What kind of flexibility has been built in if we are foreseeing a structural change of society?

Jin'ichiro Yabuta commented that the strongest message he received in listening to the presentation and from reading the report was the inclusion of the bottom-up approach in the building of the information systems. He addressed this from his own experience, and tended to support the bottom-up approach for two reasons.

Firstly, central statistics, prepared on a standard classification and consistency nationwide, very often do not provide the information on key issues of a certain area. He cited an example of his experience in southern Thailand relating to the rubber plantations. Rubber was the key development issue there, but there was no information on when or where the rubber plantations were developed, when they were planted, or the yield at present. This information was missing. There was an agricultural census at the national level, but it covered only such things as size of holdings, land area, and number of trees; the same as for rice, corn, cassava, or other agricultural produce. These statistics did not have information about when rubber trees were planted. Likewise, the rubber statistics prepared by the Rubber Division of the Department of Agriculture concerned only export, rubber prices, quality of processed rubber, and similar things, but they did not have any information about when or where trees were planted. The missing information is very vital to replantation of rubber, which is the most important product of that province.

Another example from that same area concerned the use of waste rubber trees as a traditional source of energy to meet about 30 or 40 per cent of the local energy consumption. Waste rubber trees contributed a lot to the community, and some of the rubber trees were being left unused in the plantations. Others were being used for fish meal manufacturing and some for furniture for export. However, there was no information on the consumption and use of waste rubber trees, even though their importance could be noted.

The second reason dealt with the fact that change in local development is quite fast -- perhaps faster than the manner of thinking by the people in the central government. It is faster than the speed of information building. The important thing in planning is how to include new things into ongoing activities. It is important to know who is doing what now. The new and ongoing activities are very important to know for planning. If there is no statistic on it, the central government people will not know about it. Only the local people will know this new, ongoing activity. For this reason the bottom-up approach is useful.

Yabuta cited the example of when a new road is constructed, a new town may emerge, especially at a principal crossroad. This town's growth may be quite fast, but it may not be an authorized or recognized municipality, so there is no statistic on it, even for urban population. Population data is prepared on the old administrative boundaries. So there is no statistic specifically applicable to this new emerged town. Therefore there can be no adequate plan preparation for this area.

Another example cited was the production of oil palm in Thailand. Oil palm was introduced about fifteen years ago and has developed very fast with 20 to 30 per cent growth every year. However, there is as yet no division under the Ministry of Agriculture in charge of oil palm, so there are no government statistics on it. Only a business journal provides oil palm statistics, but those do not concern where, how much, and by whom oil palm is planted. It is concerned only with the national oil palm output. The provinces where the oil palm is booming cannot plan land use for the future transport needs of future agriculture without information on what is going on regarding oil palm. So the central government is behind on the situation. Local governments probably could get the information by rather easy methods if they decide to do so, since they are close to where the production is taking place.

Training needs for local and regional planning should have more emphasis on strengthening the capabilities to identify what is the most important information to be prepared, rather than the use of information or how to make information. Bokhari used the term integration in relation to bottom-up approach, but perhaps the term should be "pinpointing" the key information among others. This kind of training is not easily accommodated in the classroom, rather it should be on-the-job training or planning exercises type training in the field.

Teitaro Kitamura noted one essential point for statistics. The speaker had commented that there was no lack of data in developing countries. They have a lot of information in different agencies. However, one should pay attention to the basis of the data as a statistical unit or as confined to the boundary of the region. In Japan there is a lot of information and statistics, but with different boundaries or units of data base. The industrial census, agriculture census, commercial census, and population census are entered on the basis of a statistical unit. The boundaries are all different. So that to combine such from the bottom up is impossible. At the national level it is useful, but at the local level we are not able to use that data. We need to take data for a village and limit it to the exact boundaries of the village, establishing fixed boundaries and using the same unit inside those fixed boundaries for whatever statistics, commercial, industrial, agricultural, or population data. Otherwise at present or in the future, we cannot use it. We have a lot of information in different agencies, but we cannot integrate that statistical data in the local area. For the future there is a need to establish the information system so as to contribute to regional and especially local plans. A good example is the agricultural settlement census in Japan, which is limited only to areas outside of towns. Therefore to do rural planning it is necessary to have town information included, but we cannot get such information.

Marvin Manheim noted that there is an interesting traumatic tension here. On one hand, there is a call for elegance and consistency in the data bases at all levels of government. It is possible that geographically one can achieve that through detailed geocoding, although that is a very, very expensive way to do it. On the other hand, the examples of changing development events and changing crop patterns suggest that the dynamics of development by their very nature argue against ever having a complete, consistent data base. The very nature of development, new settlements, new crops, or new industries mean that no coding scheme can be static and survive.

What this suggests is that fundamentally it is a problem like one of his first planning jobs, which was to merge data from three different statistical sources, and he notes that the problem is still not solved. Perhaps it never will be.

It seems that there are two operative issues. As a basic matter of training, we should not train people to seek the ideal of a single data base and coding scheme, because they will never achieve it, certainly not in developing countries. Rather we need to train people in how to be comfortable in working with multiple data bases and with multiple inconsistent coding schemes. This also suggests that there is a research void, that perhaps there has not been enough attention in statistical method to systematic techniques or combining of data from multiple inconsistent schemes, and maybe this suggests that there ought to be some research stimulated. The link to the computer involvement is that we might expect very sophisticated statistical inference procedures for pulling data from multiple coding schemes to be developed, but that these techniques might be packaged in very simple, user-friendly software that even an unskilled person could use without having to understand the underlying theory and sophisticated mathematics.

So in fact, we might like to see the development of microcomputer software using techniques that are not existing, but techniques that truly respond to the information needs of the developing environment, such as being able to pull data from multiple inconsistent coding schemes.

Toshiyasu Noda commented that in order to integrate the various kinds of statistics which are produced by each ministry, the Japanese National Land Agency tried to make an integrated data base to correct the data by a 1 km^2 mesh. They have already established a village data base; however, Kitamura has found it impossible to use it in his study because of geopolity. He wants to establish a specific statistical unit for his studies. One key issue here is how to integrate those statistics.

Another question relates to information exchange. We have to give a higher priority to information exchange and perhaps to look at several examples of success and of failure of regional development and regional method. From experience in the establishment of a very big land data storage, it still seems quite difficult to use such a data base. There has also been established, with some success, an information exchange data base which introduces some successful examples of regional development from one prefecture to another prefecture. That seems to be working properly now.

Hiran Dias posed a question on integrating data in terms of special units. If we really get down to the bottom of the problem, the village unit will probably be the smallest unit for which data will be collected and aggregated in terms of additional village units. Although it will not solve the entire problem, it will solve part of the problem, and to that extent the current situation, because at the moment it is taken at the village level and already aggregated at districts and different departments. So this actually does commit us to a bottom-up approach.

The system of data collection with the National Statistical Council and also an Advisory Committee, where the users and producers are able to meet, has been described in the presentation. However, it appears that this happens only at the top level. Is there any integration with the people who are using and collecting data at the lower levels? Is there any communication between the top and the bottom? Is it only the people at the top talking to each other, and not people at the bottom and top talking to each other?

Linda Carlisle observed that there has been talk mostly about information in terms of statistics and other types of quantitative data. But the real value of information, it seems, comes when you do something with it, and when we learn how we should go about developing or acting on the data we have before us. It seems that what we do with that data or how we should be trained to think about what to do with the data has not been addressed yet.

A. S. Bokhari responded, first by dealing with bottom-up. The basic philosophy is to involve the people in not only planning, but also in data collection. Through the UNICEF-backed programme, they have been getting statistics, and in ten of the districts they have prepared district plans based on the data collected by the people themselves through the representatives of the people at the union council level. Certain people were trained in the collection of data, and questionnaires were standardized, keeping in mind the limitations for a district plan. Each local councillor comes from a village, and he has to be trained on the collection of data in the particular format in question. The people were given a standardized form in their local language with very simple questions. That gave plenty of information for the preparation of a plan at the local level. Information comes from a household, it is aggregated into a village information, and then aggregated into a union council information, and then further aggregated at the level of the district to formulate some unified documents which can give people some capability to match the targets and resources.

The difficulty encountered was that the resources were lying with the central government and the responsibilities for providing social and economic services were either at the regional or district level. The resources and responsibilities were at two different places. The collective targets come from the top, but the needs come from the bottom, and there should be some place where the two can marry. This is the district as far as the local level is concerned, and the province as far as the organizational level is concerned.

Concerning calling the system "comprehensive and integrated," it refers to what the situation was in 1969-70 when the present system was designed. There were only a few cells here and there in the provinces and centres in the federal level which could give the information for plans. The reorganization of the National Statistical Council, supported with technical advisory committees, getting feedback from above and below, and supported by line and regional departments at the regional level, is fairly comprehensive and integrated in comparison to what existed in 1969-70. Before, planners and producers never came face to face. In this system people come face to face and attain understanding, and try to resolve issues. For those allergic to that term, perhaps "an improved version" of the system could be used.

Reference was also made to data treatment in the year 2000 and various trends from agricultural to urban society. That is an important question. Pakistan was 78 per cent rural when it gained independence in 1947, and it is 72 per cent rural now. There has been tremendous pressure on agricultural land, but in spite of such, there has been no decrease whatsoever on the agricultural population. You have to draw certain inferences in making future projections from the past culture. We have a culture which is embedded in the village. If from anywhere, Pakistan society draws its strength from the values of its village society. So we have a static agrarian society; and therefore it can be said with confidence that for the next three, four, or five decades — at least one generation -- Pakistan is going to remain a rural society fundamentally.

CLOSING SESSION

Thursday, 19 June 1986, 11:00-12:30 hours
Chairperson: Linda K. Carlisle
Rapporteur: James F. Goater

The chairperson invites the chairpersons for each working group to present the recommendations (outlines) which were formulated during their discussions. (Group three, chaired by Manheim, who formulated the Conclusions and Recommendations of the meeting as a whole is invited first of all, to present.)

Manheim delivers the findings, suggesting that the meeting should read through each section and bring up any points which seem relevant.

Working through the draft Conclusions and Recommendations, corrections are ironed out prior to substantive discussion on the actual content of each paragraph.

Interesting discussion revolves around whether or not "human resources" is the key constraint to adopting new technologies. Nijkamp disagrees, saying that power failure, broken telephones systems (e.g., in Calcutta) also constitute serious constraints. He suggests a change in terminology. Lindsay disagrees, on the grounds that technical constraints always end up as political restraints (i.e., human), citing the ease with which the Indian Army is able to get things done. Sundaram intercedes with a compromise, noting that telephone malfunctions, power failures, etc., are being remedied but remain an additional constraint to technology renewal. The change is adopted. Manheim observes that paragraph 3 of the Conclusions and Recommendations was an attempt to summarize the discussion which centred on large data bases vs. simple technology, while paragraph 4 is most relevant in terms of UNCRD. Paragraphs 5 and 6 are accepted, without discussion, by the group.

Regarding paragraphs 7 and 8 Manheim notes that two distinct types of networks were defined by his working group.

(i) those engaged in training, to share experiences and material.
(ii) User networks which may spawn a series of subnetworks, sharing software, etc.,

Sundaram observes that the word 'user' should be clarified in paragraph 8, to effectively distinguish between the type of network outlined in the previous paragraph.

Manheim enlarges on paragraph 9, Training Issues, emphasizing, as well as information systems, the range of additional topics which need to be taught and associated subtopics.

Van de Putte observes that the other two groups were charged with formulating actual training programmes, to which Manheim agrees, though noting that they were not necessarily the totality of the courses which should be designed. Lindsay differentiates between the sensitizing of planners, and the role of information in planning. (They are different areas of activity, he suggests.) Sazanami observes that "Training" in subsection (g) includes the training of trainers, therefore, an additional subsection on "training of trainers" seems unnecessary, but so as to indicate that the group discussed training of trainers as a separate issue, the phrase "Training, including the training of trainers" was adopted. Paragraph 10, Industry involvement, was adopted without discussion, while paragraph 11 elicited discussion centred around examples of professional and volunteer organizations involved in developing countries.

Paragraph 12, Promoting Innovations is adopted without discussions.

The director comments on paragraph 13 (Laboratories) requesting clarification on "Institutions." Are these envisaged in developed or developing countries? Lindsay responds that they could be anywhere — in developed or developing countries. They could also be training and implementing, adds Manheim.

Paragraph 14 is on Publishing; the chairperson wishes to know if this paragraph is geared towards UNCRD or other institutions. Lindsay says, again, it is primarily geared towards any institution.

In the final paragraph, Research, van de Putte seeks clarification, which is provided by Manheim. Masser adds that he would like to see research embrace analysis of previous work, comparative evaluations of different approaches, etc., saying that research should not be only experimenting with new approaches. The phrase "comparative research and evaluation of" is added. Lindsay, Manheim, Masser, and the chairperson combine to rewrite the first sentence, "Research is needed to develop and experiment with new approaches to the use of information systems in planning and development and especially in comparative analysis and evaluation of alternative techniques and experience." Masser adds that he would like to see "alternative research strategies" replace "detailed recommendations." This is agreed to by Manheim.

Kitamura returns to paragraphs 7 and 8, claiming that in the establishment of networks, stated in both paragraphs, some duplication is present. Manheim reiterates his claim that two different sets of people are involved and that user needs are different from training organizational needs. The user network would be huge. The training network would be focussed on training establishments. Many parallels would exist, overlapping software libraries, etc. Different needs/resources for each group exist. Kitamura continues on the theme — he notes the difficulty of separating trainer from user, especially in the more advanced courses; he thinks one unified network is desirable. Lindsay explains that we are all part of large numbers of networks and the difficulty of determining the networks should not prevent, in this case, the identification of two different networks -- one for trainers and administrators of training courses, and one for users. It is possible that many of the same people will be in both networks.

The chairperson having determined that there are no omissions or disagreement from participants, says that the draft Conclusions and Recommendations now represent the Conclusions and Recommendations of the meeting.

Moving on to the second group's work, viz., formulating a training course for senior managers, the chairperson invites the meeting to examine the distributed document. Miscellaneous corrections are noted as the participants read the sections.

Seeking discussion under each heading, the chairperson, who was a member of group 2 leads the session.

The training objectives and target group sections are accepted without comment. Course method was enlarged upon by the chairperson. Lindsay, supported by Manheim suggests the addition of some "hands-on" experience, actually using advanced information equipment. Manheim adds that attitudinal change is induced by the physical use of technology.

Moving on to course design, Kitamura wants clearer definition of "Senior Managers," viz., what kind of managers. The chairperson replies that the target groups are the senior managers in regional planning agencies and regional development projects.

Sundaram and Manheim suggest the further definition, "...senior managers who are decision makers or policy planners."

Manheim remarks that the fifteen minimum number of participants is a considerable restraint; he thinks it unwise to recommend such a minimum. The 15-35/50 range is more desirable as long as small groups can be arranged and adequate hands-on time is allowed.

The chairperson suggests 15-30. Masser says there is no need to focus on numbers. Manheim says that numbers should allow small group "breakouts" and adequate hands-on time. Sundaram returns to the question of "Where." It is explained to him that this suggests the vast range of training institutions, agencies, as well as "best practice" locations, should all be taken into account. Manheim adds that this is an "illustrative curriculum" which could be tailored to suit the nature of the institution that is offering the course."

Trainers need to be aware that the process of training at this level is also a process of intervention in policy (Lindsay). van de Putte is generally more agreeable to a heterogeneous group which would lead to horizon expansion, than to Lindsay's homogeneous groupings. Masser compromises by saying whether or not group members are from the same background matters little -- the amount of prior presentation for the course is critical. The chairperson remarks on the importance of different approaches, i.e., injecting a member into the group who appears against the training (van de Putte's idea). Lindsay says there is a difference here (i.e., who selects participants?). He goes on to say that the meeting should make it clear that training, at this level, is intervention. Bokhari observes that rather than training, it becomes orientation. Dias agrees; Lindsay says they are inseparable. Masser halts the proceedings by saying all this is really embodied in group 3's Conclusions and Recommendations.

Manheim offers a new pitch for the course by suggesting another way to initiate it, i.e., by asking senior managers what issues are confronting them now and how do they intend to confront them when they get back. They then formulate action-oriented plans (discussions/brainstorming/training/shared experience are all useful here).

The chairperson then invites Peter Nijkamp to introduce the objectives of group 1 "Information Systems Planning Course for Regional Planners."

The objectives and target groups are accepted without discussion. Under the kind of training needed (4-6 weeks) Nijkamp describes each section, enlarging where necessary, as per the handout. The meeting follows this without comment.

Having worked through the suggested course, Nijkamp emphasizes that the course is by no means an exhaustive list -- it is an open suggestion, it is ambitious, it is for advanced personnel. It has a high degree of complexity.

Masser suggests that there is an additional objective, in addition to the one outlined, i.e., to broaden people's range of practical experience (how to exploit these people's experience, which is sometimes superior to trainers).

Nijkamp agrees that pilot studies/case studies bring together personnel in a confrontational situation. This is advantageous for UNCRD.

Lindsay finds himself much less in sympathy with this course than the previous one; he thinks it is not a course in Information Systems Planning. Development is not technicalities. Regional planners and information personnel have different concerns. Putting them together reinforces non-action planning. The training must open awareness of planners on the promise of information systems/information technology -- "You don't discuss saws/hammers without carpentry."

Nijkamp and Sundaram see this as a totally different view, the former arguing that it depends on the clientele. In Nijkamp's experience the target groups do not have specific interests in the broader philosophical issues raised by Lindsay. There is an interest on technicalities; group 1 is focusing on a specific client group, while Lindsay's statement is related to a different group.

Masser's contribution aims at compromising between the two. He sees a broad merging between the approaches employed by both group 1 and 2.

Kitamura observes that there is an absence of knowledge about planning methodology/techniques. UNCRD's orientation should be on planning techniques which include computer analysis and diagnosis. An advanced course would have slightly different requirements.

Manheim is interested by the discussion as it indicates the existence of many different market segments -- many forms and forces. A strategic question arises -- different institutions should tailor specific courses for what they perceive to be a particular market segment; another strategy is to see teaching as a series of modules developed on a multiinstitutional approach. Information technology and planning method are rapidly changing, hence continuing update is needed. This includes software compatibility, and requires a multienvironment approach. The educational objective seems to be a hugely rich territory; an open university approach is more valuable than a specific course approach. The challenge is great.

The chairperson observes that there is a training/education problem.

Sundaram sees the meeting running into problems. It is too early to rush into course design; time constraints should not engender haste. Further meetings and studies are needed, to provide UNCRD with what it needs. Dias does not see too much philosophical problem as long as two clear aspects are kept in sight. A set of questions regarding information itself are asked, i.e., Why do we need information? What information is needed? How do we get it? and What do we do with it? He feels the second two are well addressed by the courses designed, but is not sure about the first two. Secondly, regarding the providers and requirees of information, he is not in complete agreement with some of the provisions.

Sundaram interjects that the course does not reflect all the areas of discussion raised by the meeting, probably due to time restrictions.

The chairperson agrees with this proposition and invites Nijkamp to respond to comments.

He wonders whether UNCRD could canvass previous trainees of its training programmes to see if there is a need for this type of course -- What type of course is envisaged by UNCRD? If there is, then a less ambitious experimental course could be run, leading to a sequential course. This step-by-step approach would be most reasonable and seems more flexible.

Sundaram tentatively agrees, but thinks some recommendations should evolve from the discussions and papers, and some experimentation with the material produced so far should be undertaken.

Kitamura supports the approach outlined by Nijkamp, suggesting that frameworks should evolve from demonstration/pilot programmes.

Lindsay goes back to Manheim's point regarding the various market segments which appear to exist, and tries to convince the meeting that there are good types of training and bad types of training, just as there is good and bad planning (large numbers of expensive, unread, unimplemented plans abound). Despite Nijkamp's interruption that this is away from the point, Lindsay continues his thesis that evaluating training is important but impossible, therefore, for UNCRD, the question should be how to introduce an information systems component to the courses that already exist. There are many information systems/technology/planning courses being undertaken -- maybe a meeting of training personnel should be called, also combining the "trained and the trainers" -- what has been valuable/not valuable, maybe from this the training component can be formed.

Sundaram wishes to say one more -- that the group recognized that a two-step approach should be adopted by UNCRD.

Masser counsels the same approach, i.e., a step-by-step approach, rather than going straight into an ambitious programme.

The Director then outlines UNCRD's social development training seminars which it began in 1983. Although the seminars produced many ideas he did not start any actual training, he says. Instead he organized further seminars in conjunction with UNICEF. Teaching modules are slowly being evolved for adaption according to local conditions. He is very amenable to the meeting's second proposal (see above). After further training seminars he wants to evaluate the outcome, then after a further three years, the modules can be further adapted. He does not expect definite training proposals, though is very appreciative of efforts so far. Sundaram expresses his ongoing approval.

The chairperson notes that from the Director's comments it is obvious that no specific further working groups are necessary. The director is then called upon to deliver his concluding remarks.

APPENDIX 1. LIST OF PAPERS

A. Papers Presented at the Meeting

Concept Papers:

Carlisle, Linda K., Fundamental Issues to Include in Training for Information Technologies

Dias, Hiran D., Varying Information Needs for Local and Regional Planning and their Implications for Training

Lindsay, John, Training in Information Systems Design for Urban and Regional Planners in Developing Countries

Manheim, Marvin, The Third Computer Revolution: Implications for Training in Developing Countries

Masser, Ian, Information Management Training for Urban and Regional Planning

Nijkamp, Peter, in cooperation with Wouter de Jong, Training Needs in Information Systems for Local and Regional Development and Planning in Developing Countries

Sundaram, K. V., An Integrated Approach to Training for the Establishment and Use of Information Systems for Subnational Development Planning

Country Case Studies:

Ameen, A. Mohamed, Information Systems for Urban and Regional Planning in India: MMDA Case Study

Bokhari, A. S., Assessment of Training Needs on the Use and Application of Information Systems for Local and Regional Planning in Pakistan

Regmi, Heera Raj, A Case Study on Information Systems for Local and Regional Planning in Rapti IRD Project, Nepal

B. Supplementary Papers Distributed at the meeting

Musyoki, Rachel N., and Timothy H. Gatara, Training Needs on the Use and Application of Information Systems for Local and Regional Planning in Kenya

Ramakrishnan, P. S., and W. M. Leelasena, Assessment of Training Needs on the Use and Application of Information Systems for Regional Planning: Case of Integrated Rural Development Programme in Sri Lanka

Regional Seminar on Information Systems for Subnational Development Planning, Visakhapatnam, India, 16-20 December 1985. "Declaration and Recommendations."

Sundaram, K. V., Data and Information Needs for Subnational Planning

APPENDIX 2. LIST OF PARTICIPANTS

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APPENDIX 3. WORKING GROUPS

Working group sessions were held to illustrate the application of some of the concepts and country experiences presented at the Expert Group Meeting. To provide an informal atmosphere, participants were divided into three working groups:

Each working group selected a Chairperson and a Rapporteur.

Working Group I:

Topic: Information Systems Planning Course for Regional Planners

Terms of Reference:

1. To develop an outline for a one-month training course on information systems for regional planners;
2. To suggest:
   - (a) the training objective for the course;
   - (b) the kind of training needed;
   - (c) the course content or curriculum;
   - (d) the training methods, strategies, and instructional materials;
   - (e) the target group;
   - (f) the instructors.
3. To suggest other potential projects for research and training on information systems.

Working Group II:

Topic: Information Awareness Training for Senior Managers in Regional Planning Agencies and Regional Development Projects

Terms of Reference:

1. To develop an outline for a short-term training course to sensitize or familiarize senior managers of regional planning agencies and regional development projects with information concepts and the implications of information technology.

2. To suggest:
    - (a) the training objective for such a course;
    - (b) the kind of training needed;
    - (c) the course content or curriculum;
    - (d) the training methods, strategies, and instructional materials;
    - (e) the target group;
    - (f) the instructors.
3. To suggest other potential projects for research and training on information systems.

Working Group III:

Topic: Conclusions of the UNCRD Expert Group Meeting on Training in Information Systems for Local and Regional Planning

Terms of Reference:

1. To synthesize the significant conclusions emerging from the discussions of the meeting and to set out some recommendations. In particular:
    - (a) To identify some training issues and problems of importance to developing countries;
    - (b) To consider the role of national and international support and technical cooperation for research and training in information systems for regional planning.
    - (c) To propose other potential projects on information systems.

Working Group I	Working Group II	Working Group III
Peter Nijkamp (chairperson)	Linda K. Carlisle (chairperson)	Marvin Manheim (chairperson)
A. Mohamed Ameen	A. S. Bokhari	Hiran Dias
Nguyen Tri Dung	Ian Masser	J. S. Edralin
Teitaro Kitamura	Heera Raj Regmi	John Lindsay
Toshiyasu Noda	R. A. van de Putte	K. V. Sundaram
	Jin'ichiro Yabuta	

APPENDIX 4: AIDE-MEMOIRE OF THE EXPERT GROUP MEETING

An Expert Group Meeting on Training in Information Systems for Local and Regional Planning will be held at the United Nations Centre for Regional Development (UNCRD) in Nagoya, Japan on 16-19 June 1986. The Meeting is being organized by the UNCRD.

The Meeting will assess the training needs of local and regional planners in using and applying information systems. These and other problems will be considered from the viewpoints of local and regional planners, academics, and information systems experts.

The Meeting will form part of Phase II of the UNCRD Research Project on Information Systems for Local and Regional Development.

Objectives

The main objective of the Meeting is to study the needs and priorities of planners in developing countries for training in the use and application of information systems, and to make recommendations to UNCRD for future activities.

The specific objectives of the Meeting are to:

1. Determine the training needs of planners in developing countries in the use and application of information systems and identify the obstacles to the fulfillment of those needs.

2. Consider the current practice in relation to training issues, with particular reference to the kind of training and skills and knowledge required in designing and implementing information systems, the course content or curriculum, training methods and strategies, and trainers for an appropriate training course on information systems for local and regional planning in developing countries.

3. Formulate a curriculum and identify the topics and components of modules for such a training course.

Approach

The approach to the Meeting is essentially informal and participative involving:

1. Presentation from leading experts on concepts and methods;
2. Country case studies by planners, describing how information systems are being implemented in developing countries, and presenting a specific case of an information systems project; and
3. Discussions on concepts and country case studies.

Participants

The Meeting is designed for planners and other technical personnel working in local and regional planning institutions in developing countries, which have established or plan to establish information systems for planning and for monitoring and evaluation. It is also designed for information systems experts and planners who are involved in Phase II of the UNCRD Research Project on Information Systems for Local and Regional Development.

Training Issues for Discussion

Gathering, organizing, processing, analysing, retrieving, and disseminating information are important activities in local and regional planning. They should be given high priority in planning institutions.

In response to the need for information, some planning institutions in developing countries have organized information systems. But there has been little use of such systems as a planning tool largely because of the shortage of trained planners, training programmes and materials, qualified and competent trainers, and adequate training equipment and facilities, and also because of the expense of training adequate numbers of personnel.

The planners in developing countries, who have attended the UNCRD International Training Courses in Regional Development Planning, are trained with specific discipline in mind, such as agriculture, architecture, business administration, economics, engineering, geography, geology, history, law, management, political science, public administration, and science. A review of the curricula of some of the training institutions in Asia and the Pacific would reveal that none make it a priority to teach trainees about information systems for planning.

The training programmes on information systems that are designed for planners in developed countries are probably not suitable for planners in developing countries. The content, style of instruction, format of programmes, and the standard teaching aids may not be appropriate without careful testing and appropriate modification. Moreover, the real training needs of planners may escape the attention of systems designers, contractors, and vendors who apply standard training packages or industry and business oriented approaches to provide instruction.

Clearly, training must be related to the training needs of planners in developing countries. The planners must be equipped with the necessary skills and knowledge-base to enable them to use information systems effectively.

From the UNCRD's experience in training, research, and advisory services, it seems that a training course emphasizing the skills in the use and application of information systems, will be a long-term solution to the pervasive need for accurate, timely, and relevant information for planning in developing countries. Planners may need to have some knowledge and capabilities in a number of technical, social, and educational areas such as the following:

1. Data collection approaches: Rapid rural appraisal; Rapid reconnaissance approaches to organizational analysis; and Data collection for project design and approval.
2. Data analysis techniques and methods: Descriptive statistics; and Models, simulations, and systems analysis.
3. Urban and regional development modelling: Micro-economic or behaviorist approach; Social physics approach; and Methods of regional analysis (regional input-output analysis, cost-benefit analysis, the gravity model, regional econometric models, and programming models).
4. Monitoring and evaluation techniques: Sample surveys, network analysis, statistical quality control, and scaling techniques.

5. Use of computers for planning applications: Available softwares and hardwares; Professional networking, information dissemination, and the use of appropriate technologies; Data base management systems; Application packages; Simple programming languages; Data processing; Computerized mapping and geocoding; and Computer management.

The issues noted below will be discussed during the Meeting. It is hoped that the results will lead to a course of study which reflects the priorities and concerns of planners in developing countries.

1. What kind of training would be needed on:
    - (a) Designing information systems for local and regional planning (i.e., preparing a design for the information system, specifying information requirements, identifying the sources of information, data collection, processing, analysis, and interpretation, and information dissemination);
    - (b) Monitoring and evaluation of local and regional plans and projects;
    - (c) Managing and using information systems for local and regional planning; and
    - (d) Sensitizing or familiarizing planners with information concepts, information-handling skills, and information technology.
2. What should be the course content or curriculum for an appropriate training course on information systems for local and regional planning?
3. What training methods, strategies, and instructional materials would be needed to provide or deliver both formal and nonformal instruction?
4. Who should be trained?
5. When should training be provided?
6. Who will undertake the task of training the planners?